10th TECHNICAL MEETING OF THE AR-TN-MS OZONE STUDY (ATMOS)

18 December 2003
Nashville, Tennessee

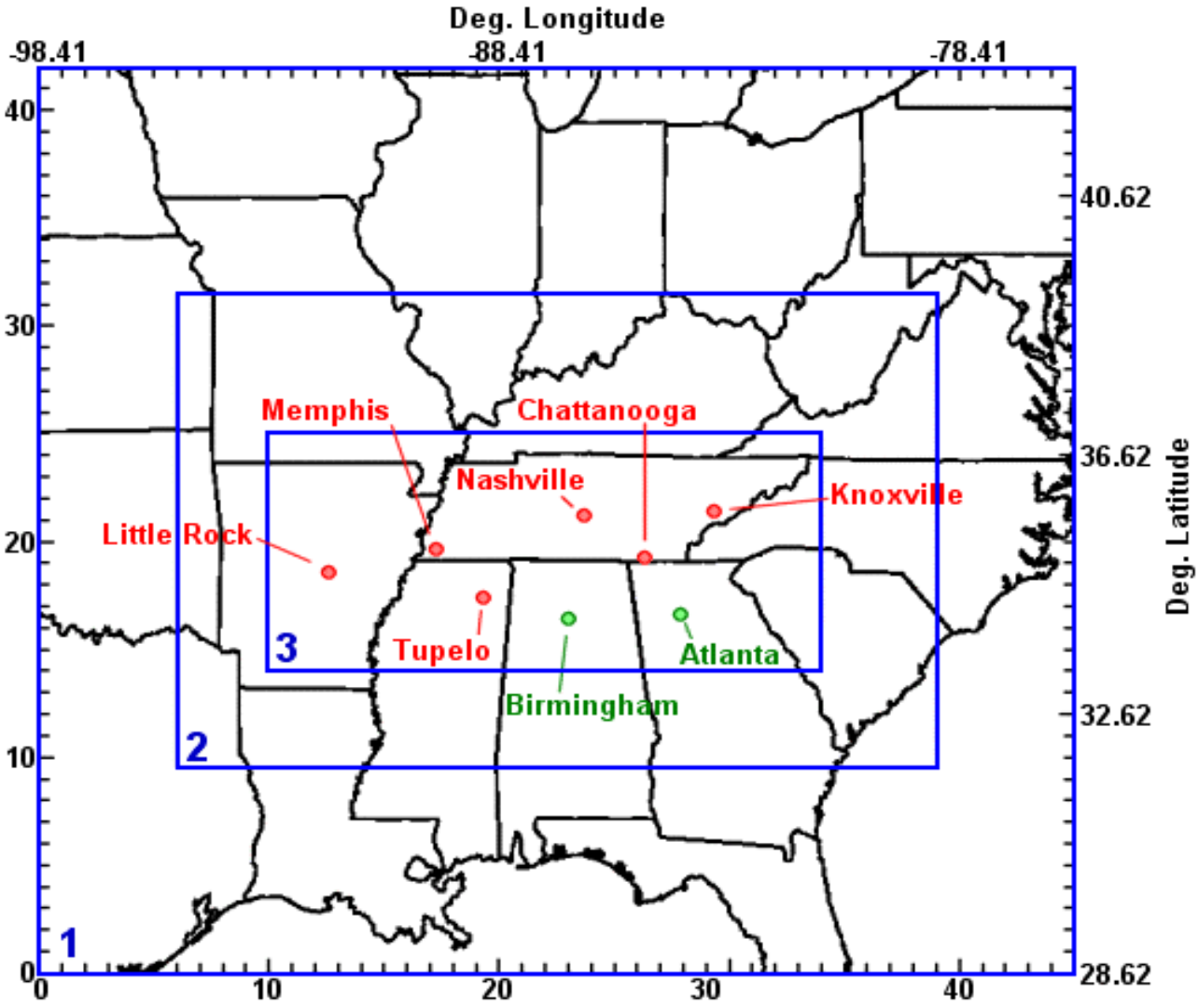
Presented to the
ATMOS Technical Committee

Presented by
Sharon Douglas & Jay Haney
Systems Applications International (SAI)
San Rafael, CA

TODAY'S PRESENTATION

- Revised 2007 emissions (with alterna VMT estimates)
- Future-year modeling results
  - Revised 2007 baseline with alternate VMT estimates
  - OPTM (tagging) scenarios (AT-1, AT-2, AT-3)
  - Emission-reduction sensitivity/control-strategy simulations (AS-1, AS-2)
- Discussion of attainment demonstrat procedures by area

ATMOS UAM-V5 MODELING

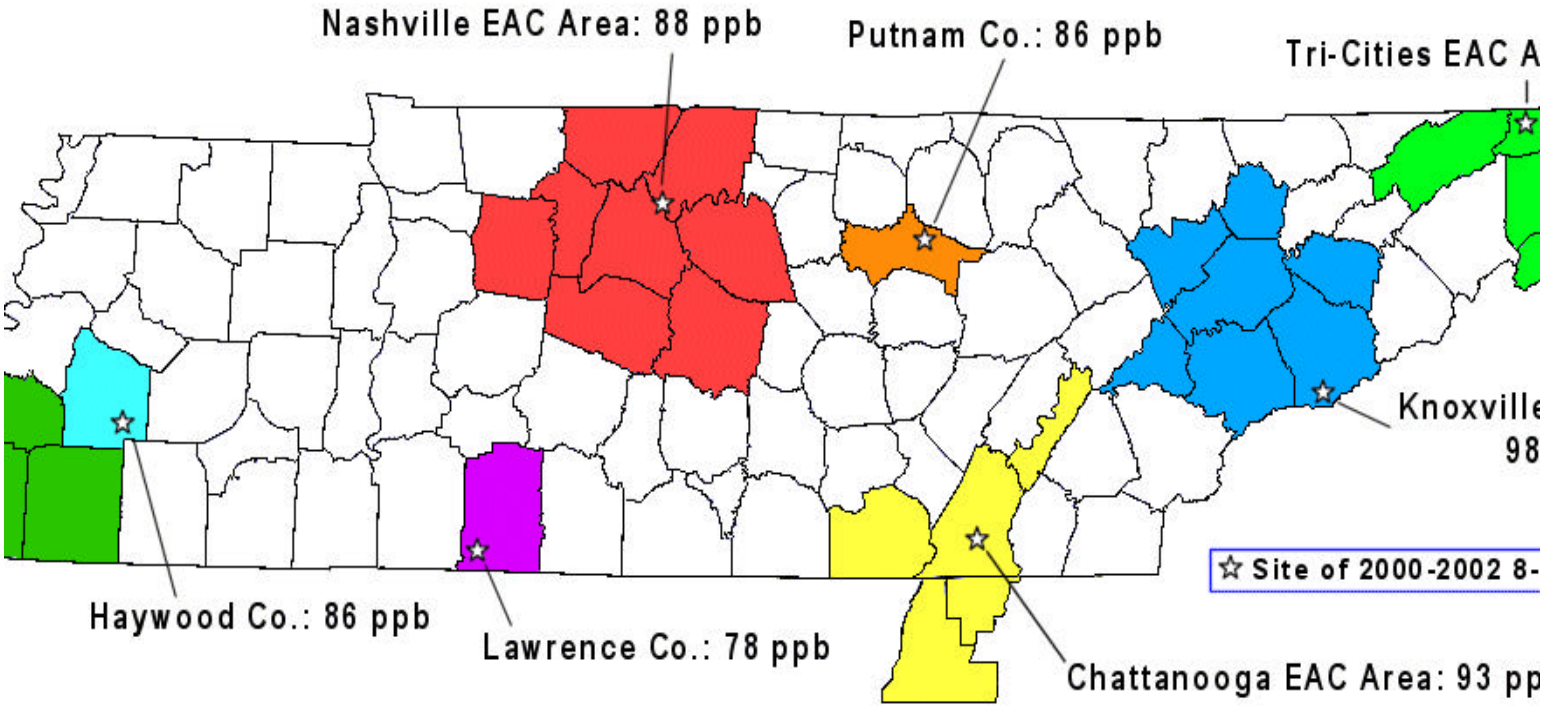


Grid 1: (-98.41,28.62) – 45x42 – 36-km Cells

Grid 2: (-95.41, 31.79) – 99x66 – 12-km Cells

Grid 3: (-93.41, 33.29) – 216x99 – 4-km Cells

8-HR OZONE DESIGN VALUES
2000-2002) FOR TN EAC AREA



ATMOS/EAC SIMULATION PERIODS

- 29 August – 9 September 1999

ATMOS Epi

- 16-22 June 2001

New ATMOS/EAC Episode

REVISED ATMOS/EAC FUTURE-YEAR (2007) EMISSIONS

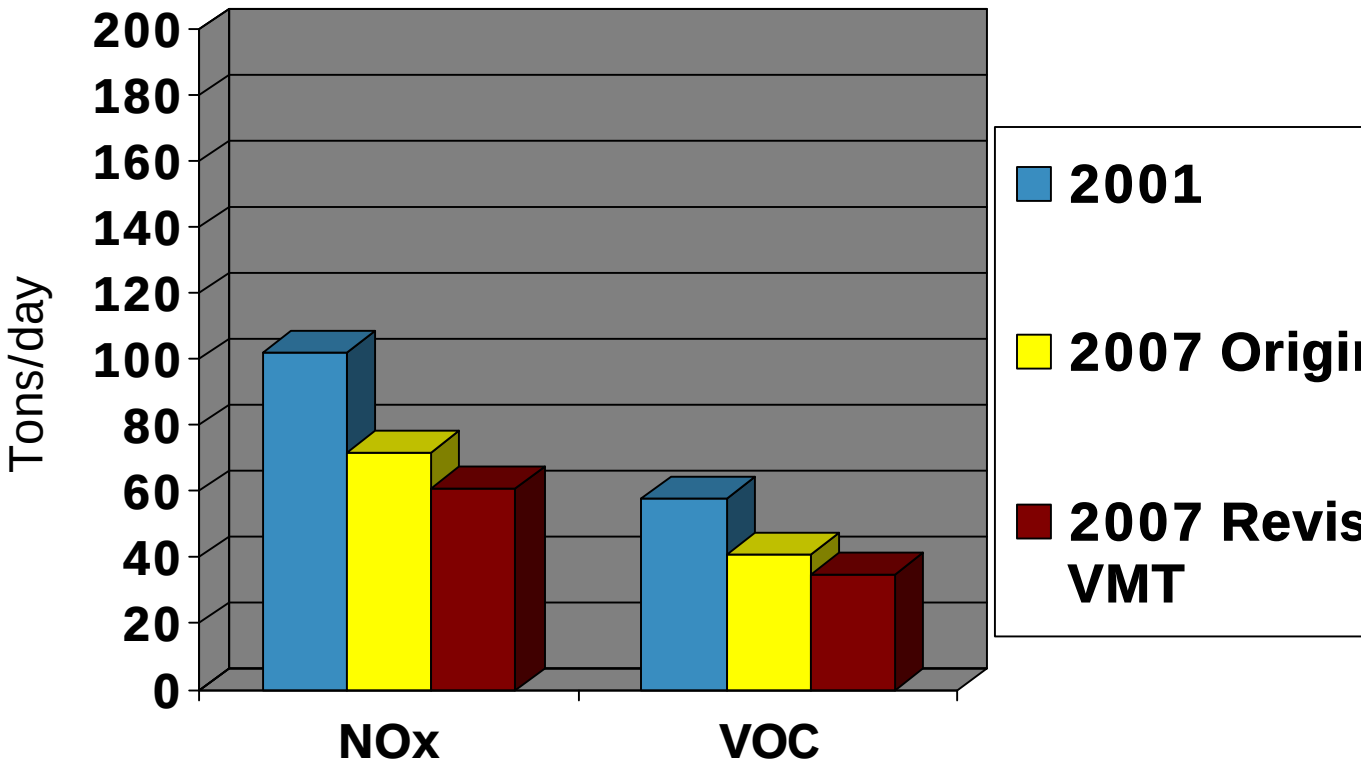
- Employ alternative VMT growth assumptions for TN based on 1998-2002 VMT trends
- Using the latest 5-year VMT trends, expected VMT and mobile emissions for 2007 are reduced compared to 1990-2002 trends

ESTIMATED 2007 VMT FOR SELECTE
NNESSEE COUNTIES USING DIFFER
GROWTH ASSUMPTIONS

County	90-02 VMT Trend	98-02 VMT Trend	% I
Shelby	28646022	23096257	-1
Davidson	24393988	19955044	-1
Knox	15571557	12088388	-2
Hamilton	11662560	9731146	-1
Washington	3306892	2767622	-1
Tennessee	218247678	175783989	-1

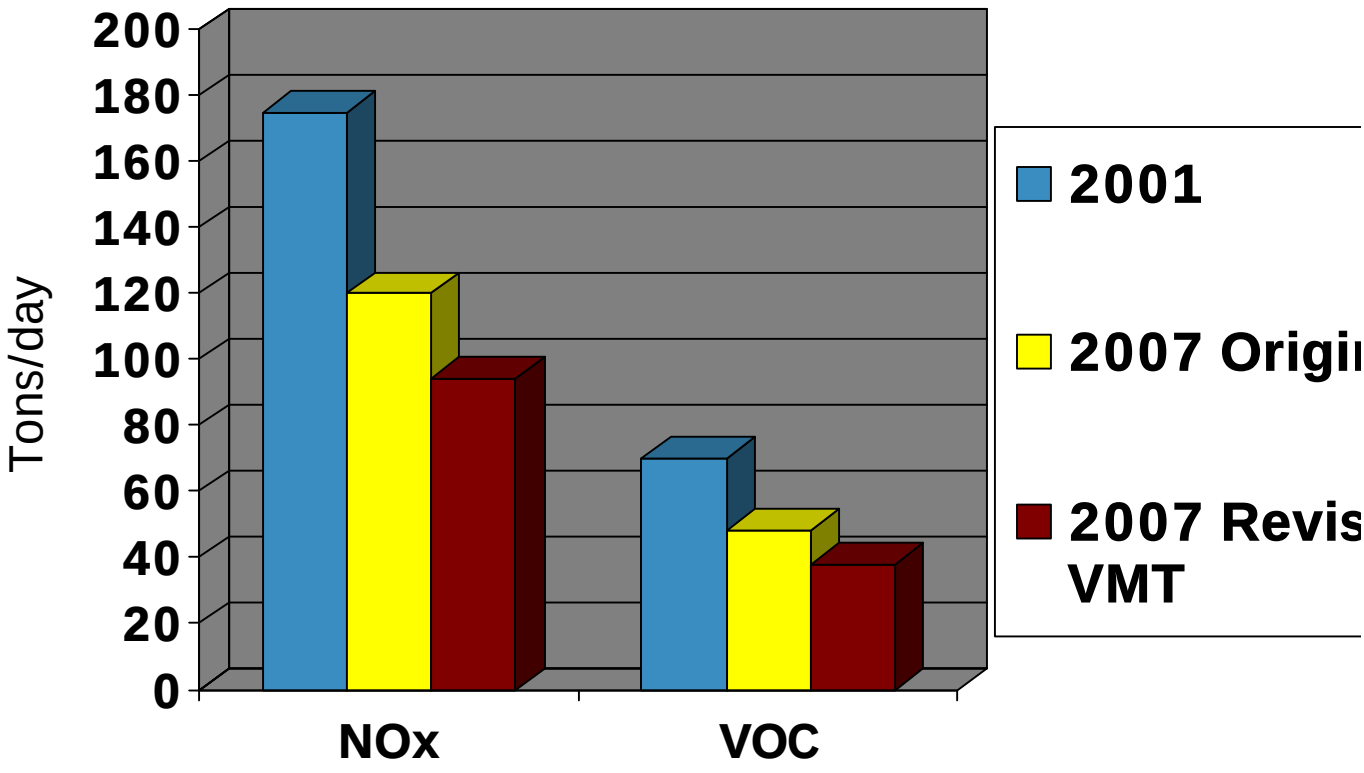
MOBILE SOURCE EMISSIONS: MEMPHIS EAC AREA

Emissions for 18 June episode day



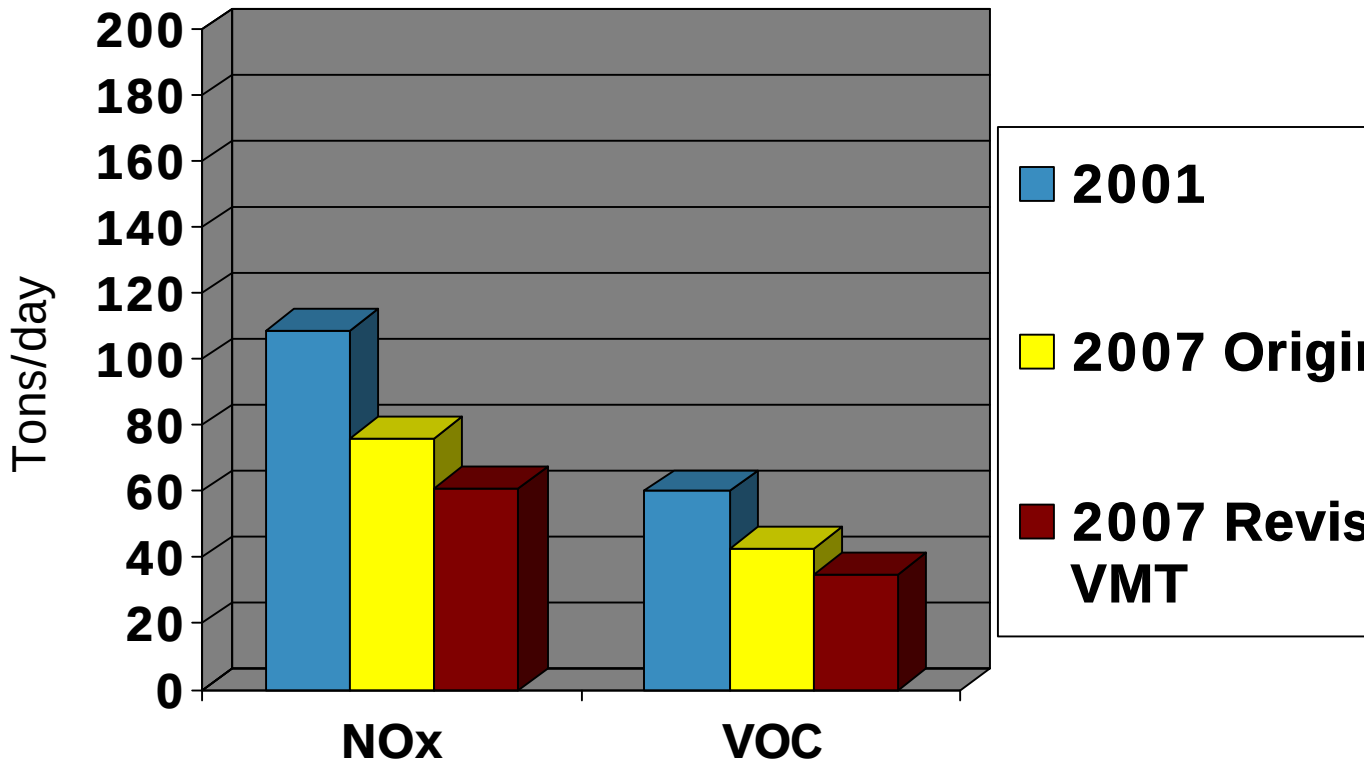
MOBILE SOURCE EMISSIONS: NASHVILLE EAC AREA

Emissions for 18 June episode day



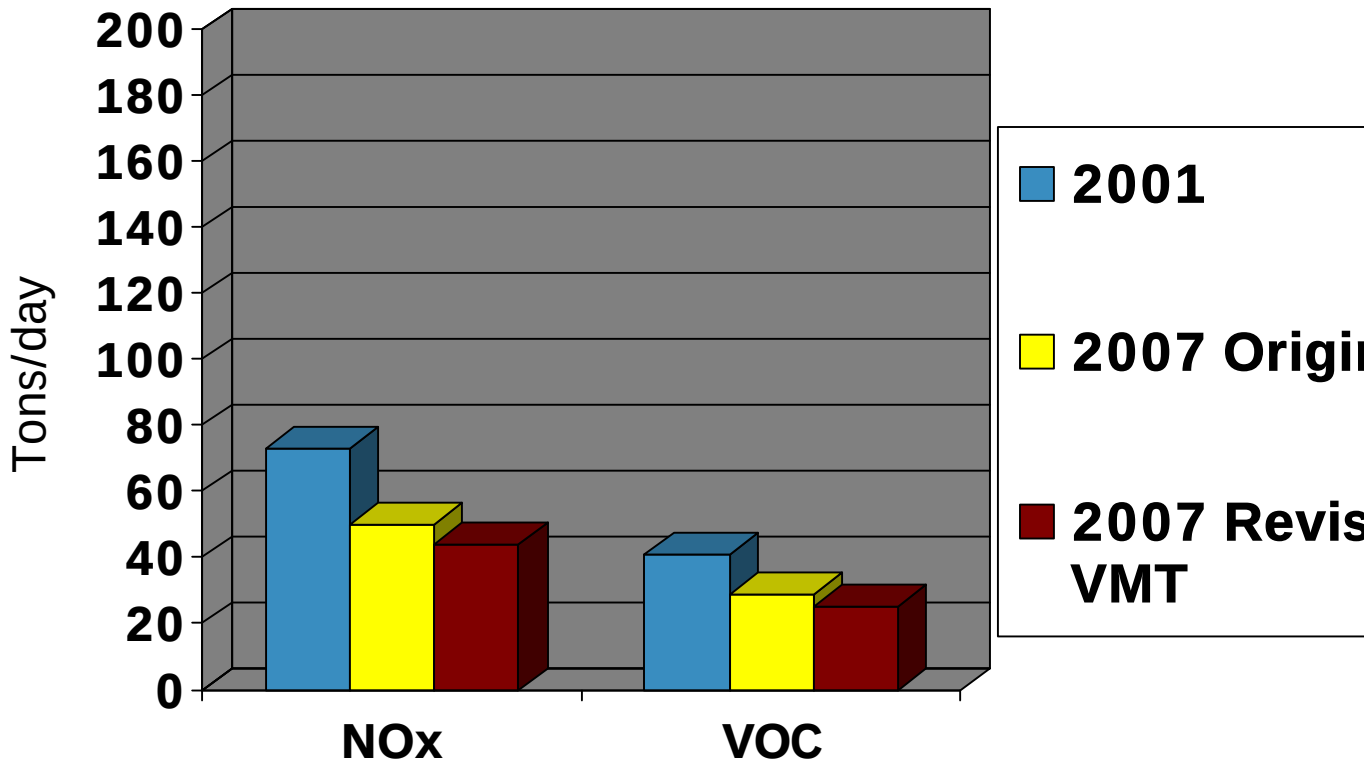
MOBILE SOURCE EMISSIONS: KNOXVILLE EAC AREA

Emissions for 18 June episode day



MOBILE SOURCE EMISSIONS: CHATTANOOGA EAC AREA

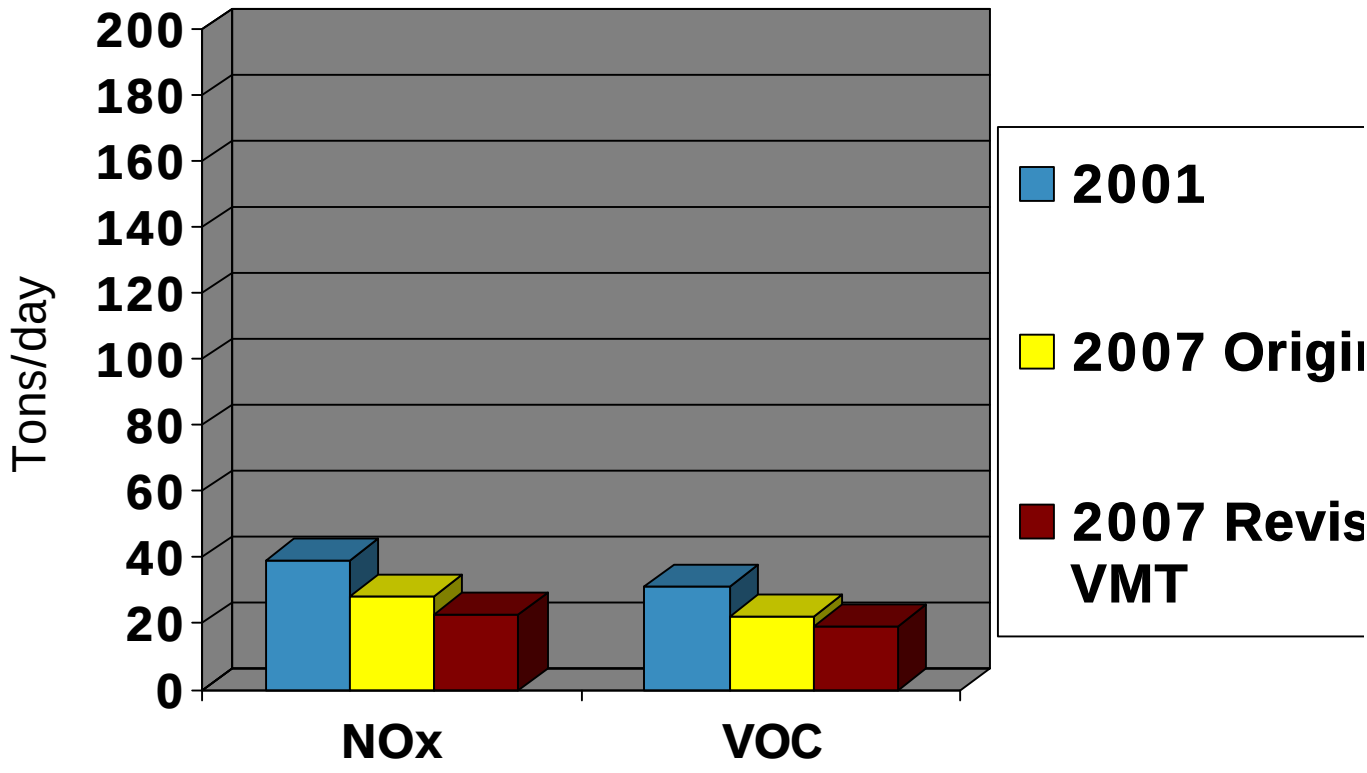
Emissions for 18 June episode day



MOBILE SOURCE EMISSIONS:

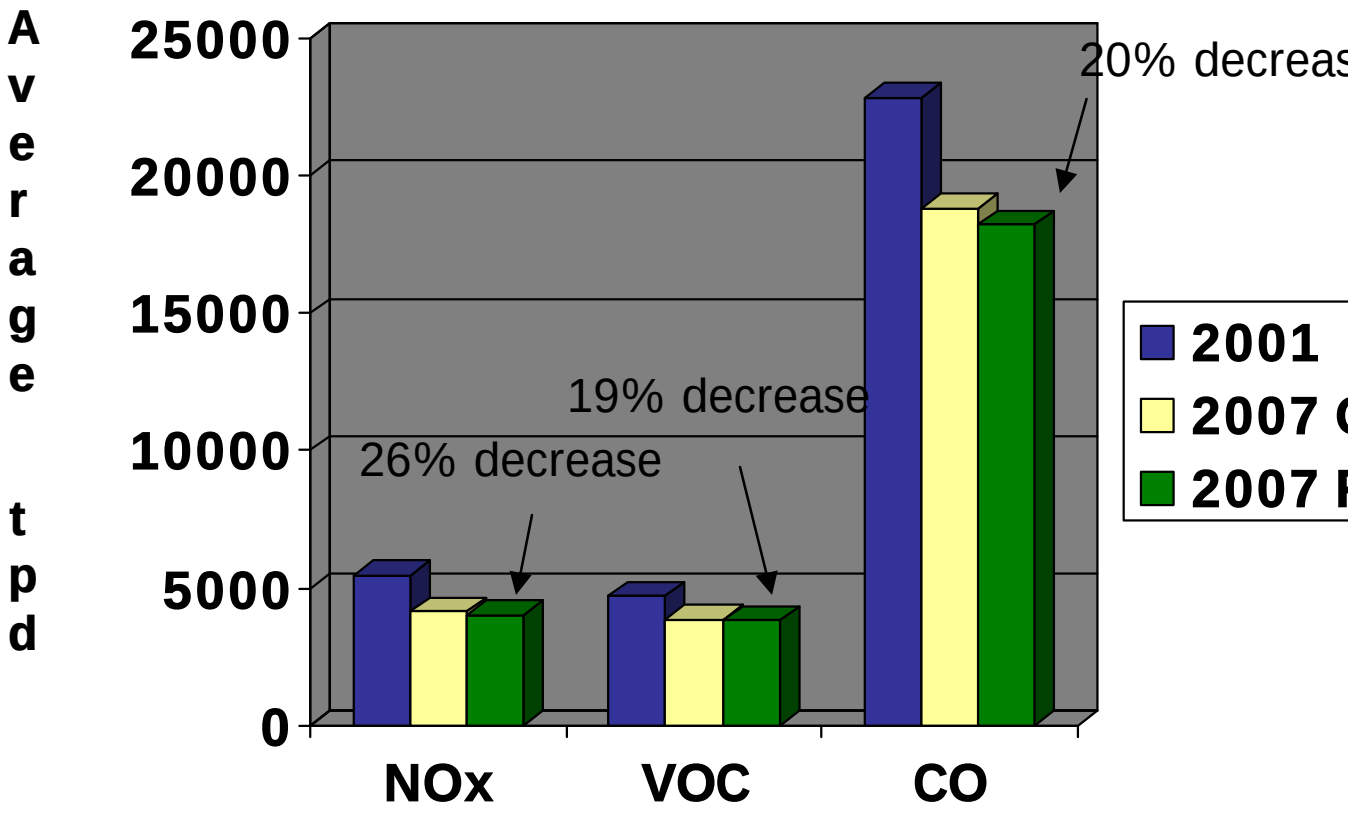
TRI-CITIES EAC AREA

Emissions for 18 June episode day



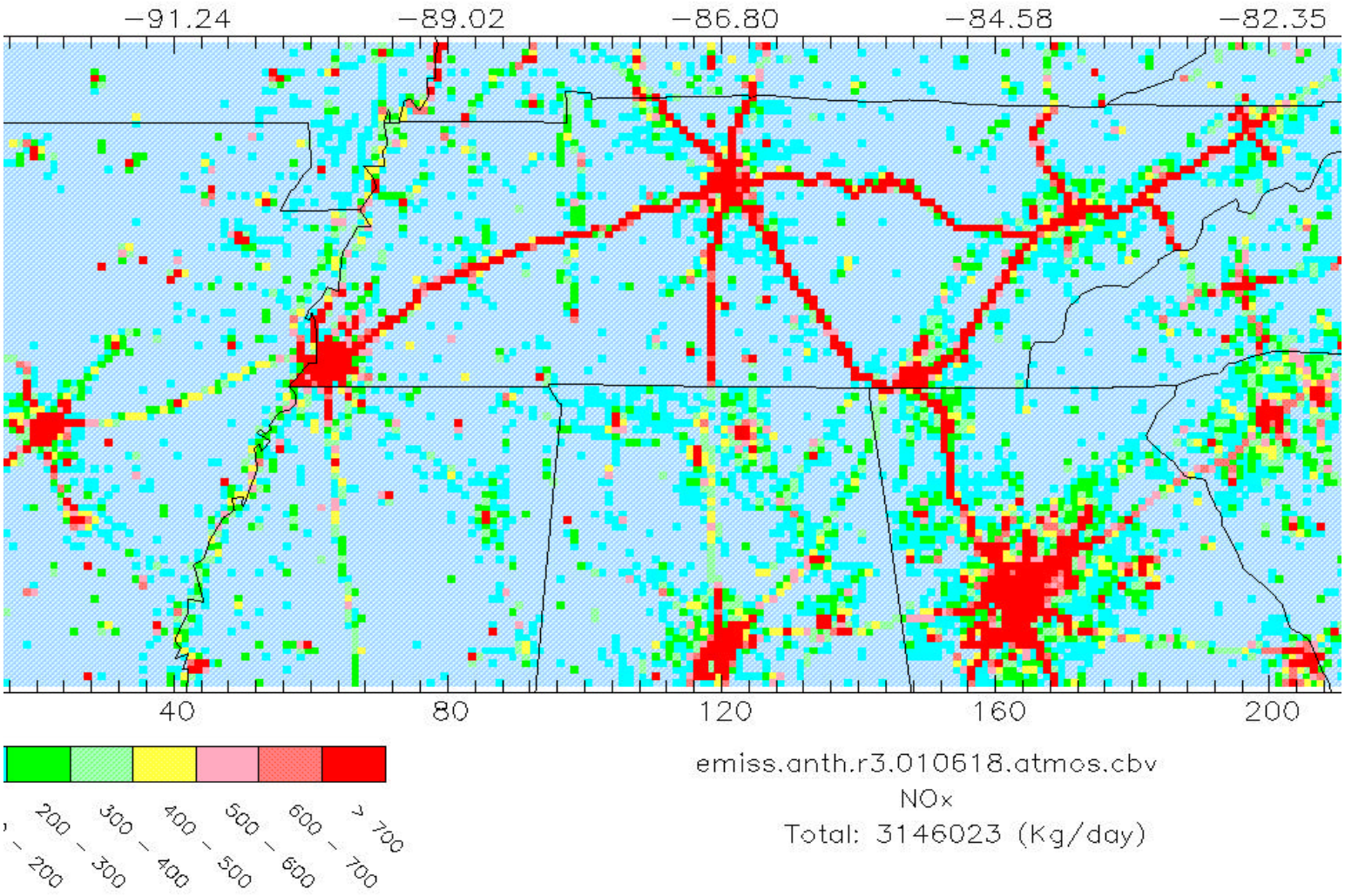
COMPARISON OF NO_x, VOC, & CO
2001, 2007 Original, & 2007 (Revised TN VMT)

Weekday Emissions for 18 June for Grid 3



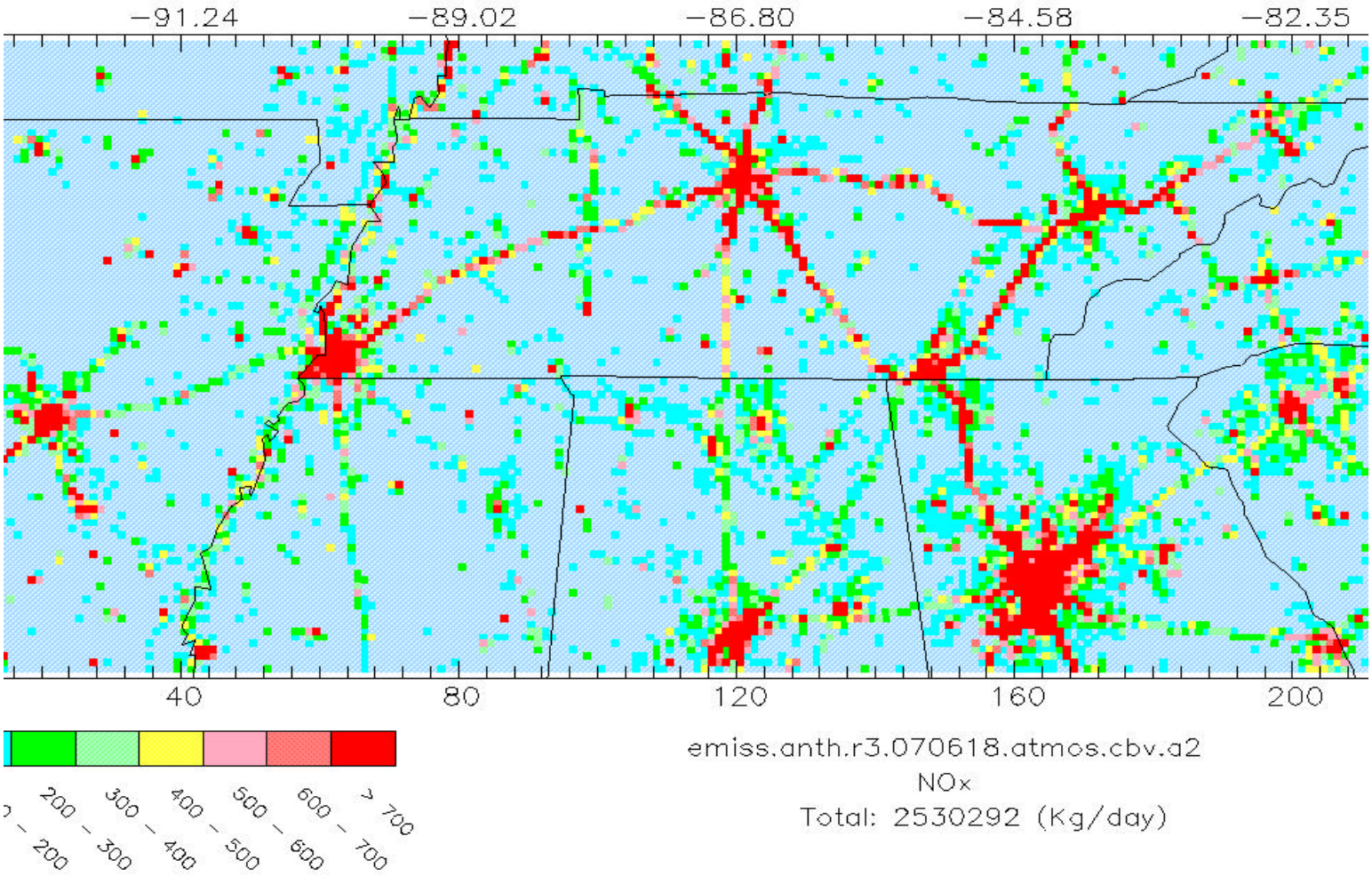
TAL LOW-LEVEL NOX EMISSIONS
BASE CASE (6/18/01)

value: 10052.3 (kg/day) at (208, 45)



TAL LOW-LEVEL NOX EMISSIONS
2007 REVISED VMT (6/18)

value: 10305.5 (kg/day) at (159, 8)



KEY ADVISOR METRICS

- Simulated 8-hour maximum ozone concentration
  - for selected domain, subregion, or monitoring site
  - [ppb]
- 8-hour ozone exceedance exposure
  - measure of the "excess" concentration and number of grid cell hours greater than 85 ppb
  - for selected domain or subregion
  - [ppb·grid cell·hours]

KEY ADVISOR METRICS

- Estimated design value (EDV)

$$EDV = RRF \cdot DV$$

  - RRF is the ratio of future-year scenario to bas year 8-hour ozone concentration in the vicinity of a monitoring site location
  - DV is observation-based, current-year design value
  - for selected monitoring site
  - [ppb]

EPA attainment test requires EDV to be ≤ 84

WHAT IS THE "CURRENT" YEAR?

August/September 1999 Simulation Peri

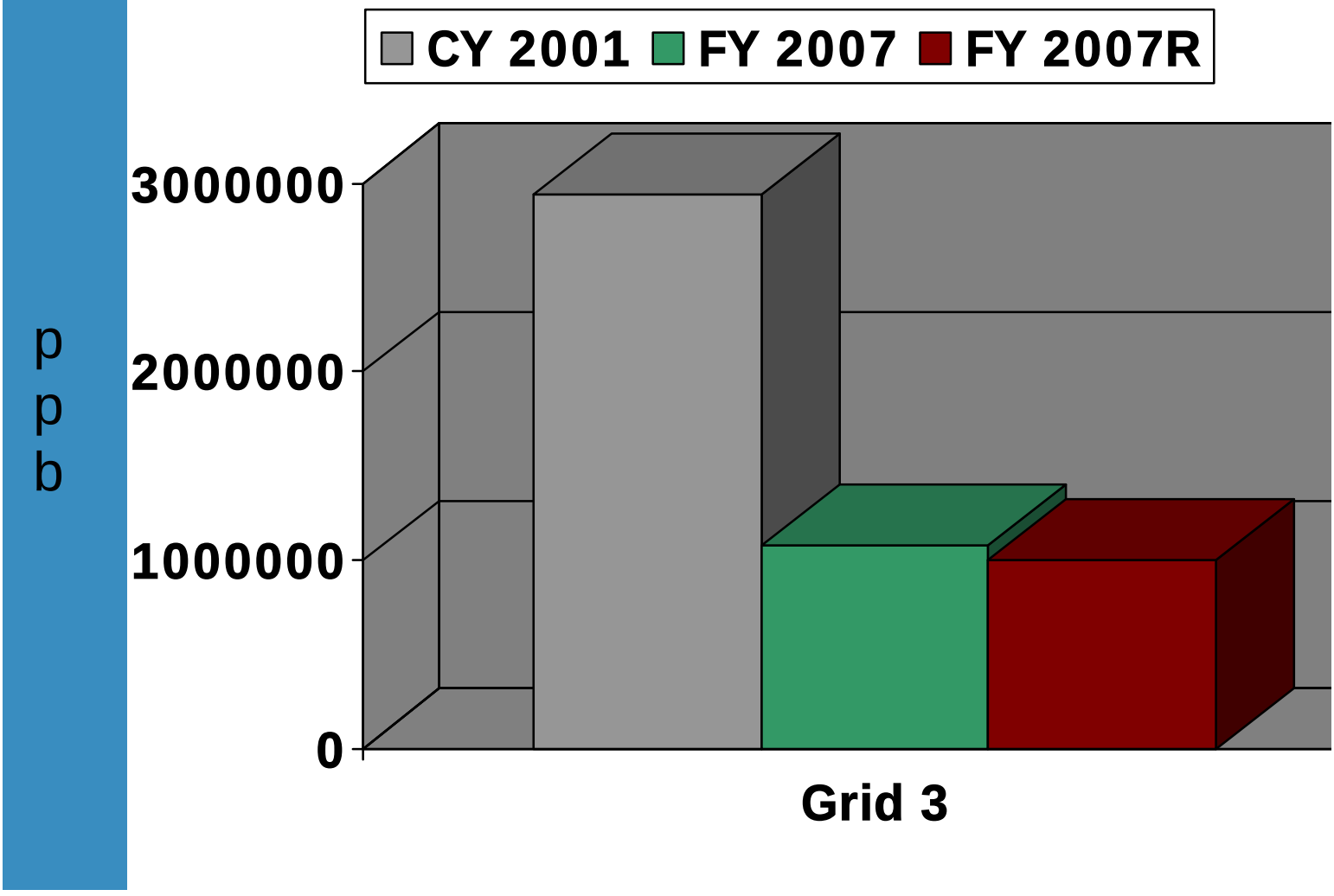
1999 Base Year → 2001 Current Year → 2007 Future Ye

June 2001 Simulation Period

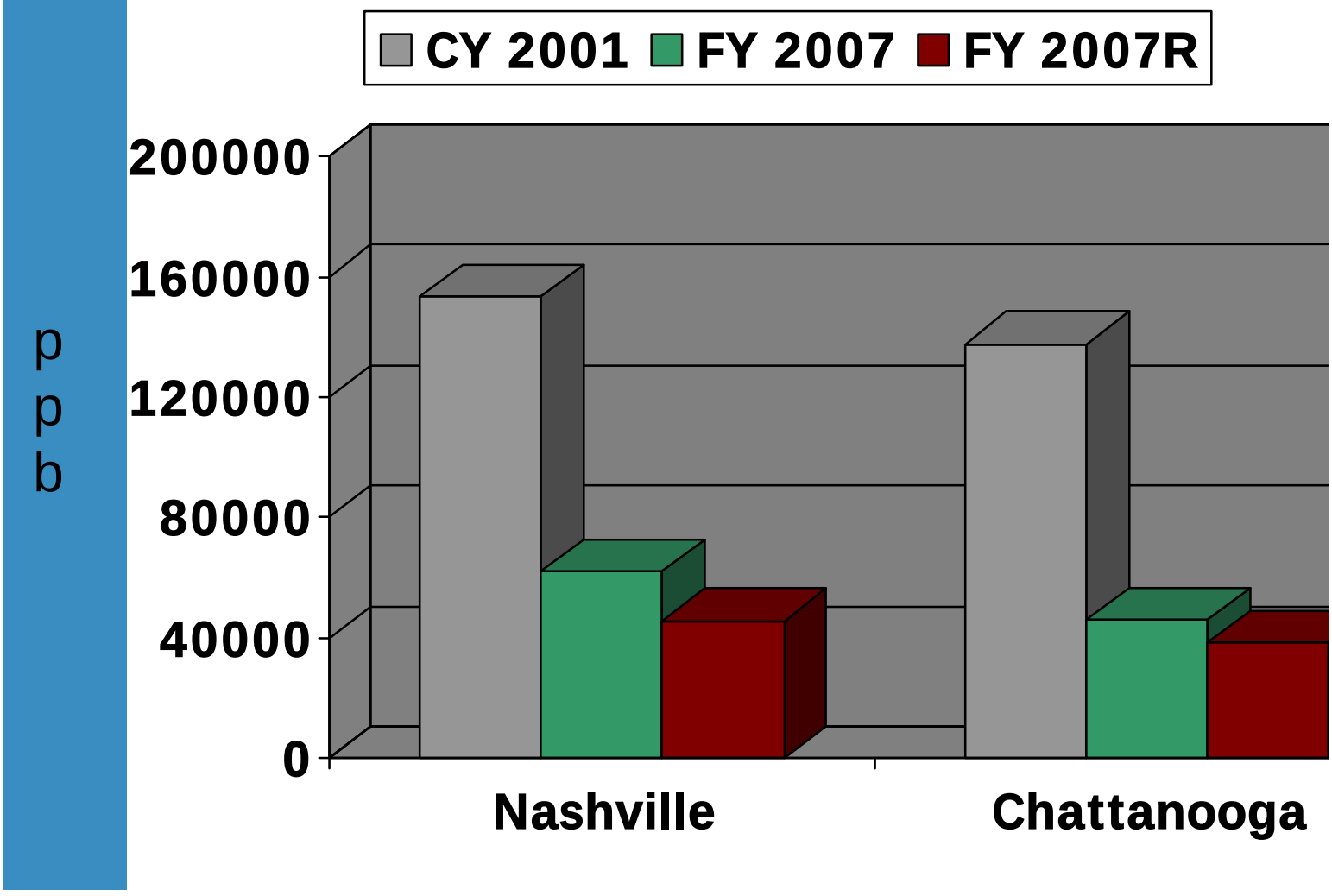
2001 Base Year → 2007 Future Y

Both episodes use the sa
projection period

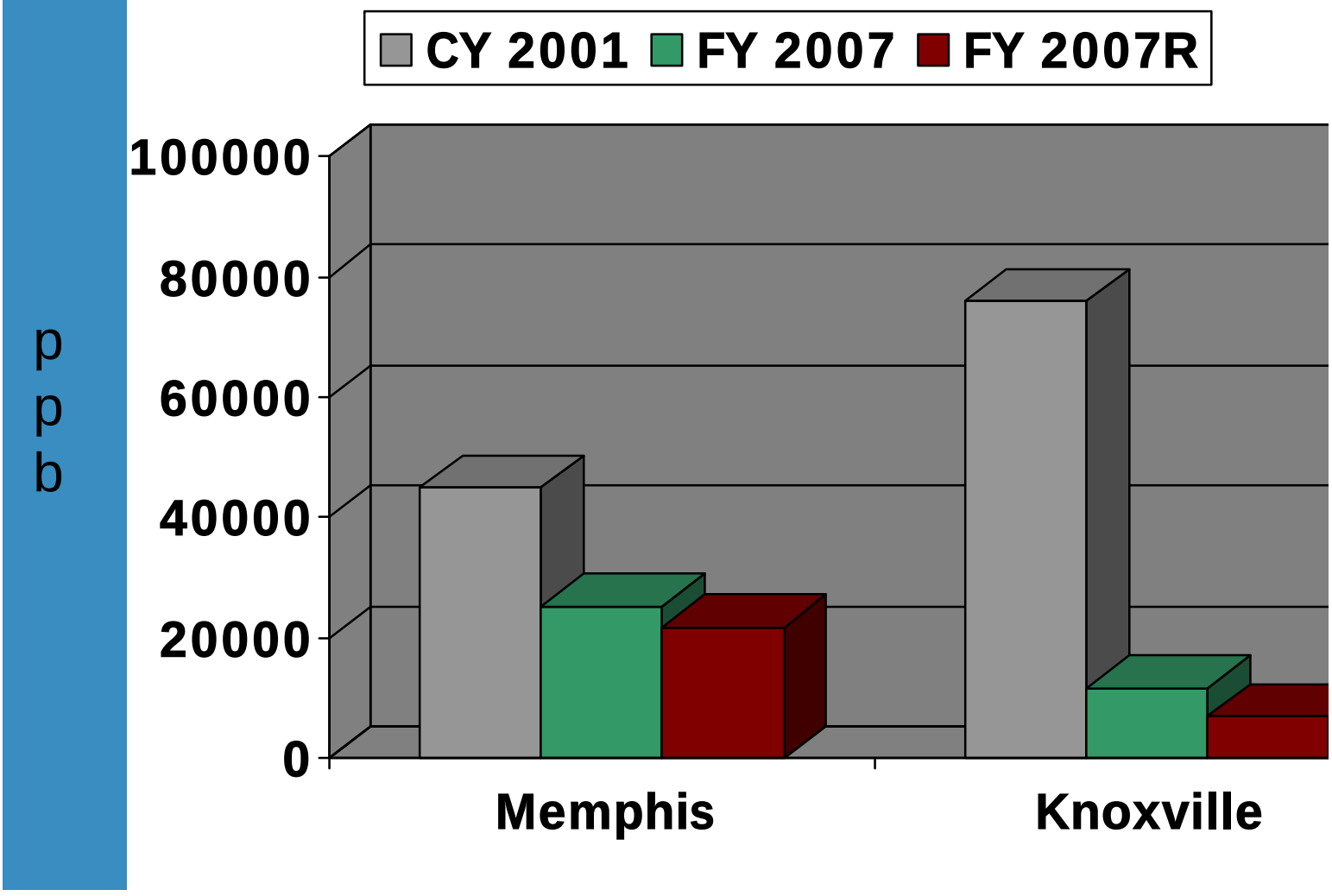
COMPARISON OF SIMULATED 8-H
OZONE EXCEEDANCE EXPOSUR



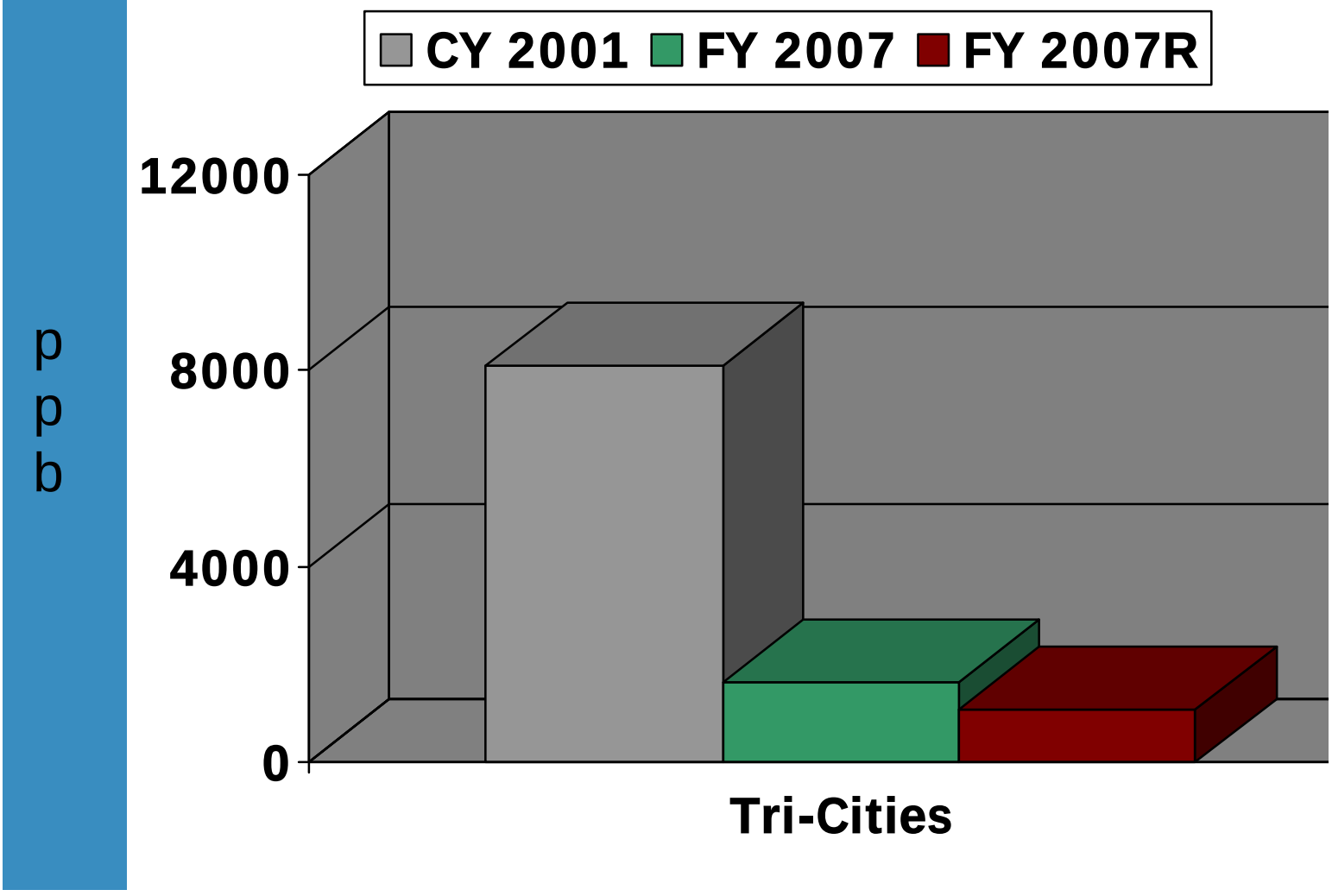
COMPARISON OF SIMULATED 8-H
OZONE EXCEEDANCE EXPOSUR



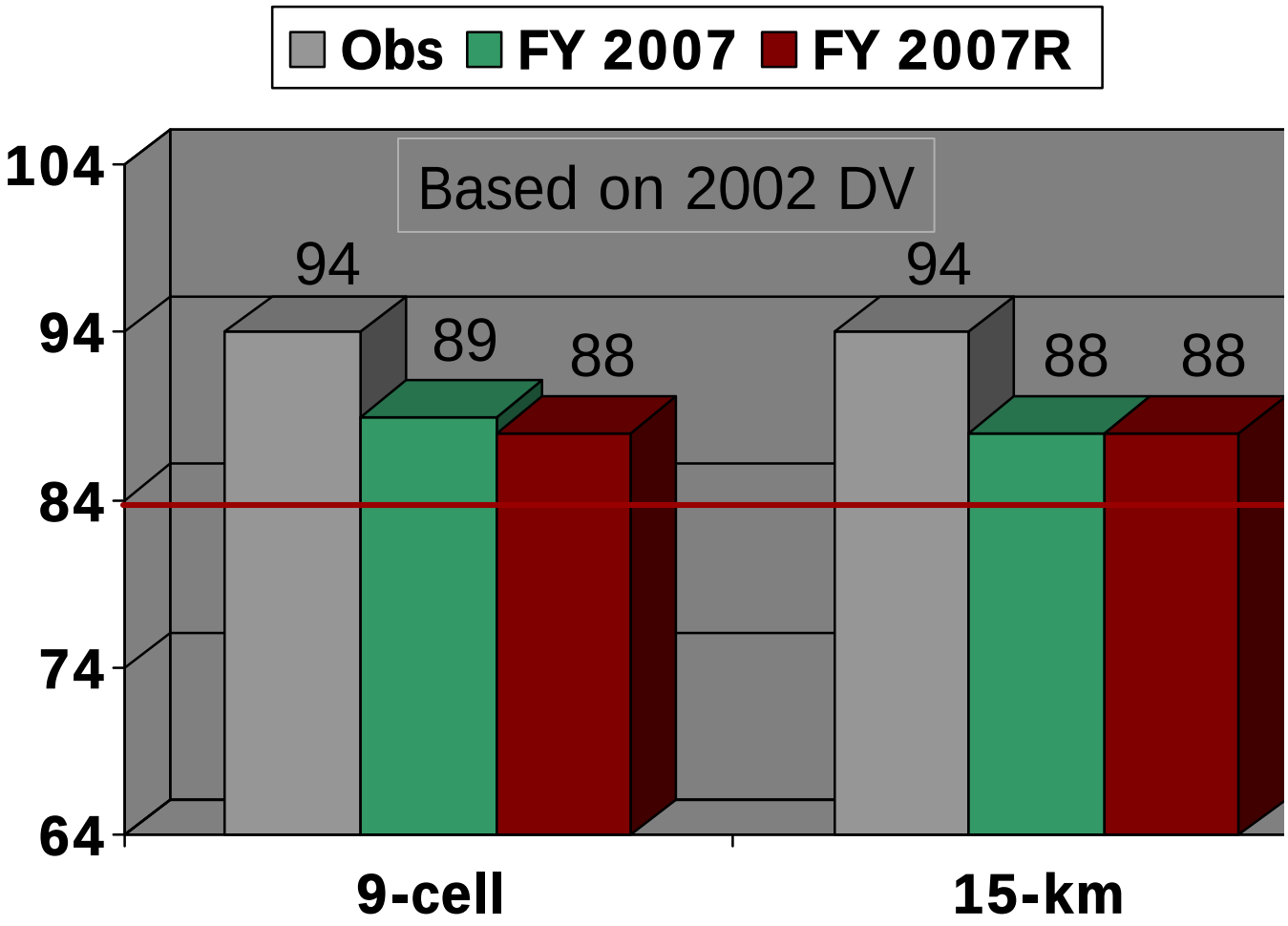
COMPARISON OF SIMULATED 8-H
OZONE EXCEEDANCE EXPOSUR



COMPARISON OF SIMULATED 8-H
OZONE EXCEEDANCE EXPOSUR



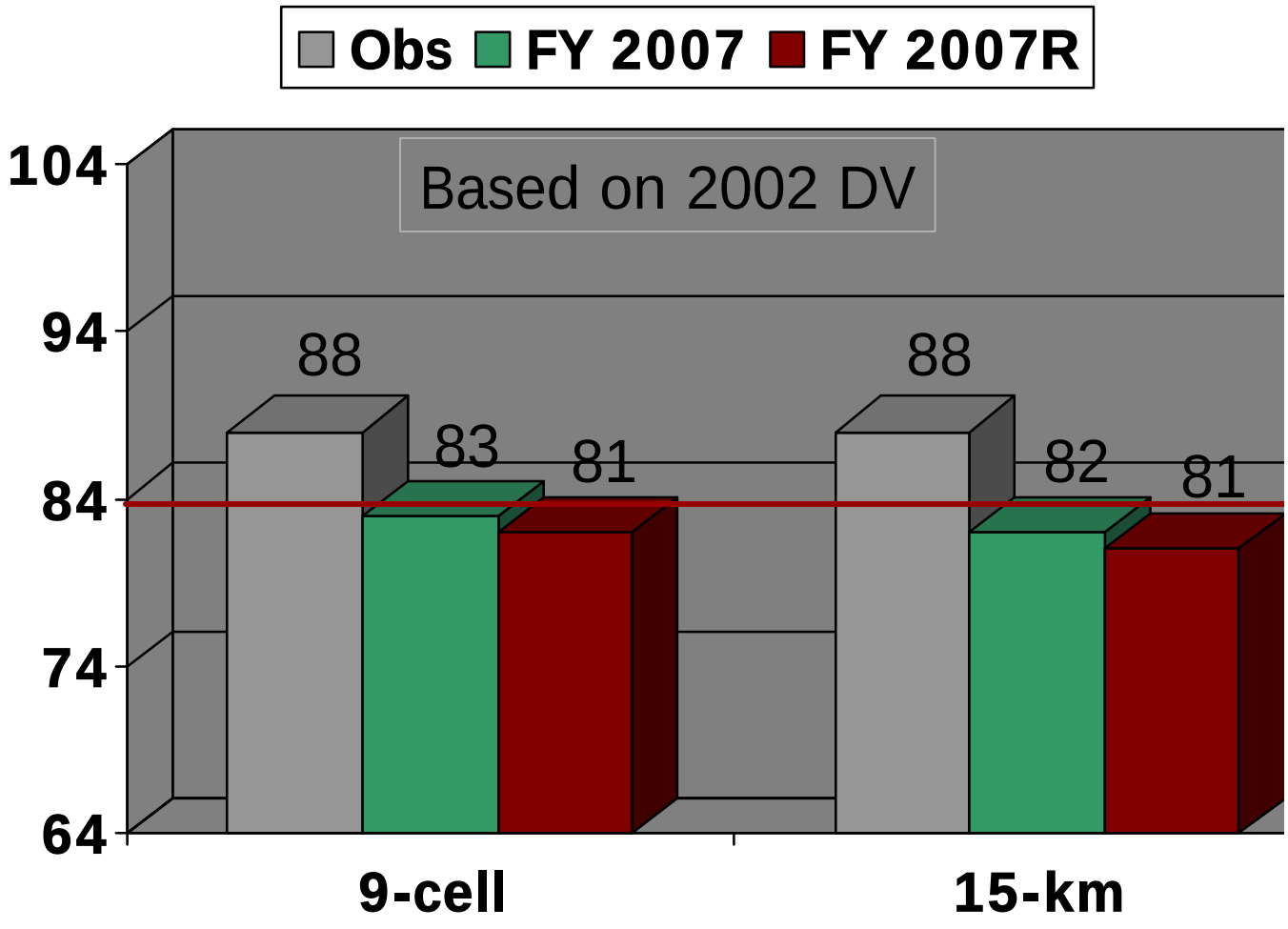
ESTIMATED DESIGN VALUE (EDV
MEMPHIS AREA



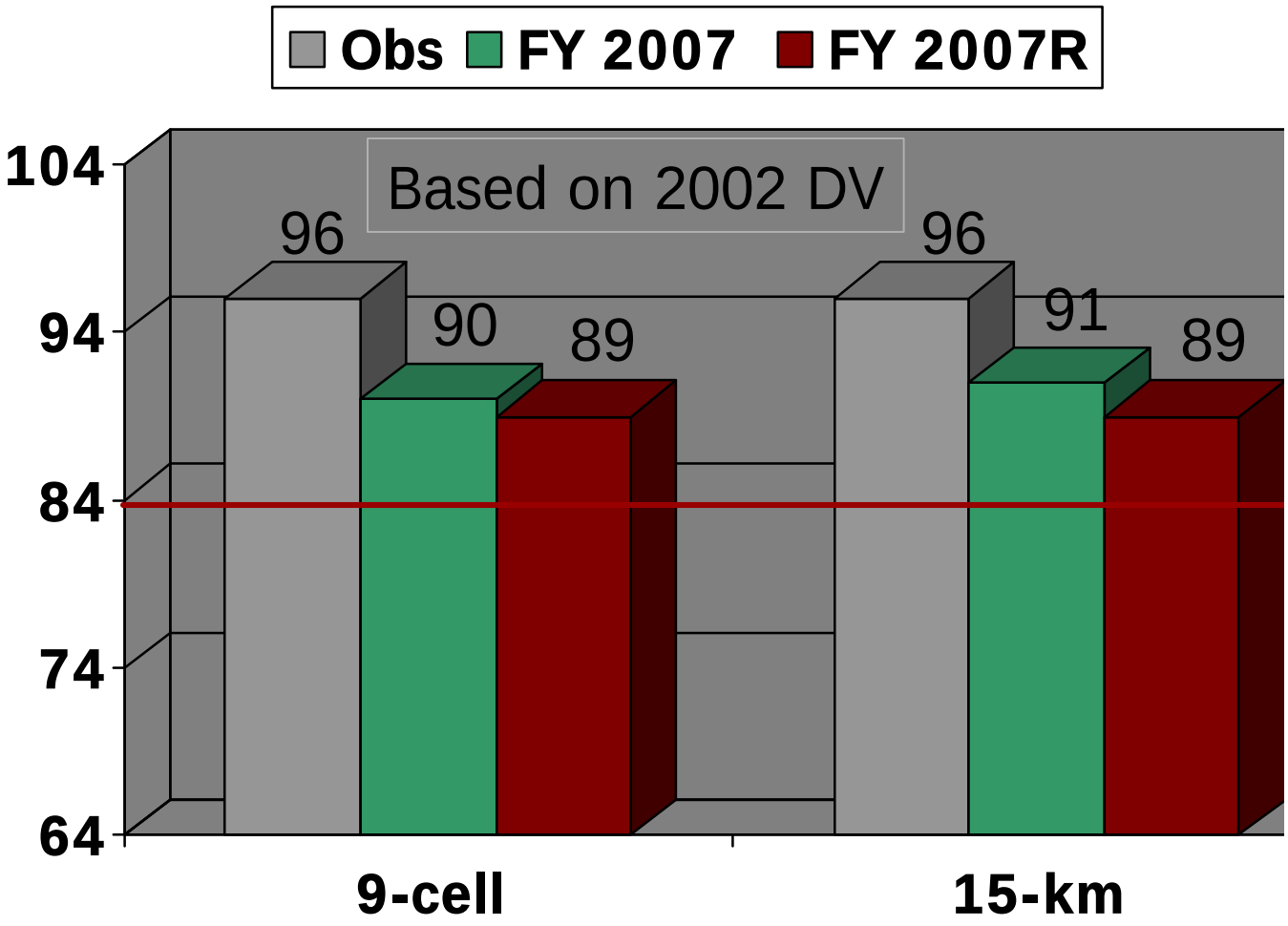
ppb

ESTIMATED DESIGN VALUE (EDV
NASHVILLE AREA

ppb

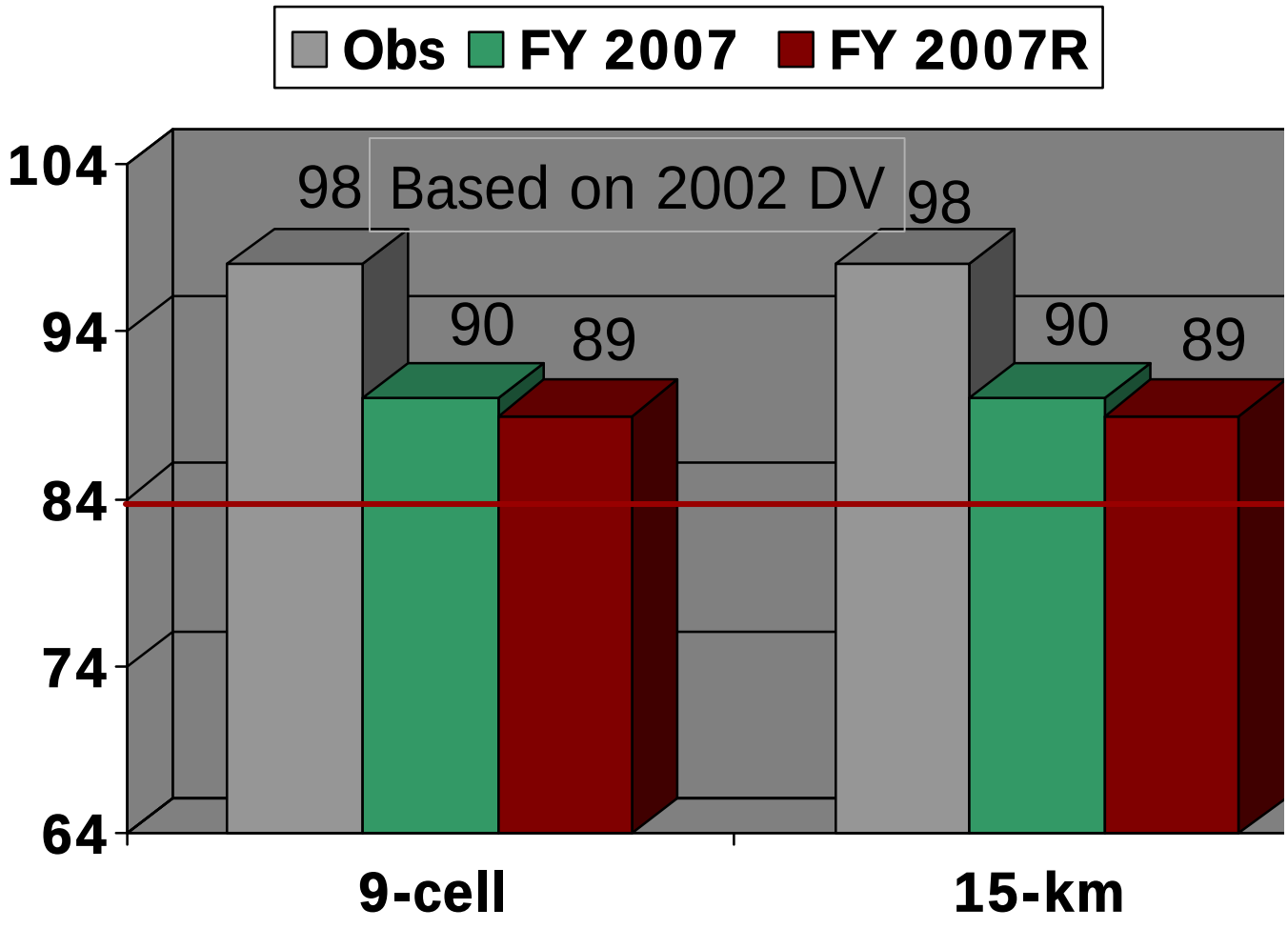


ESTIMATED DESIGN VALUE (EDV
KNOXVILLE AREA

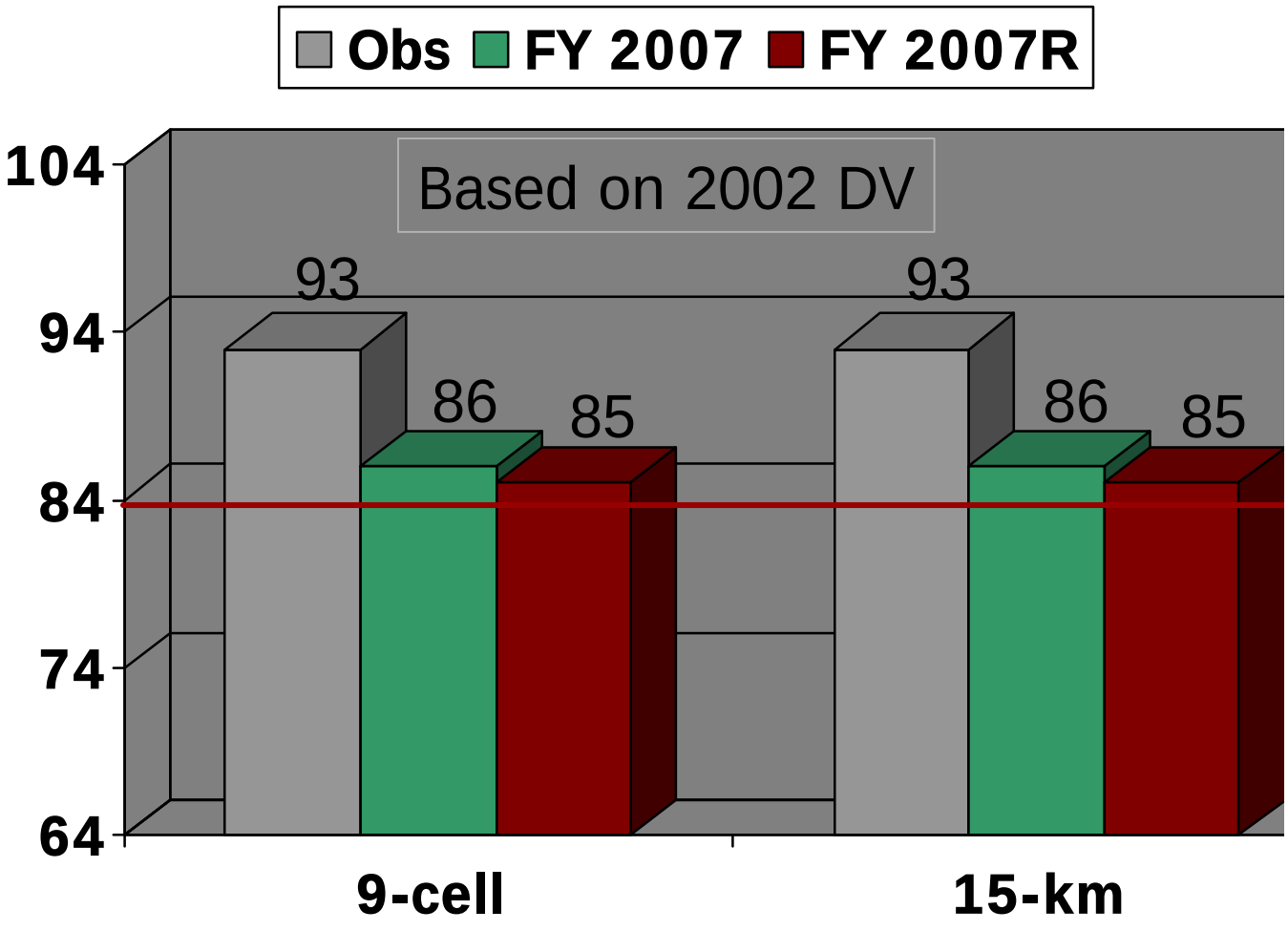


ppb

ESTIMATED DESIGN VALUE (EDV
GSM AREA

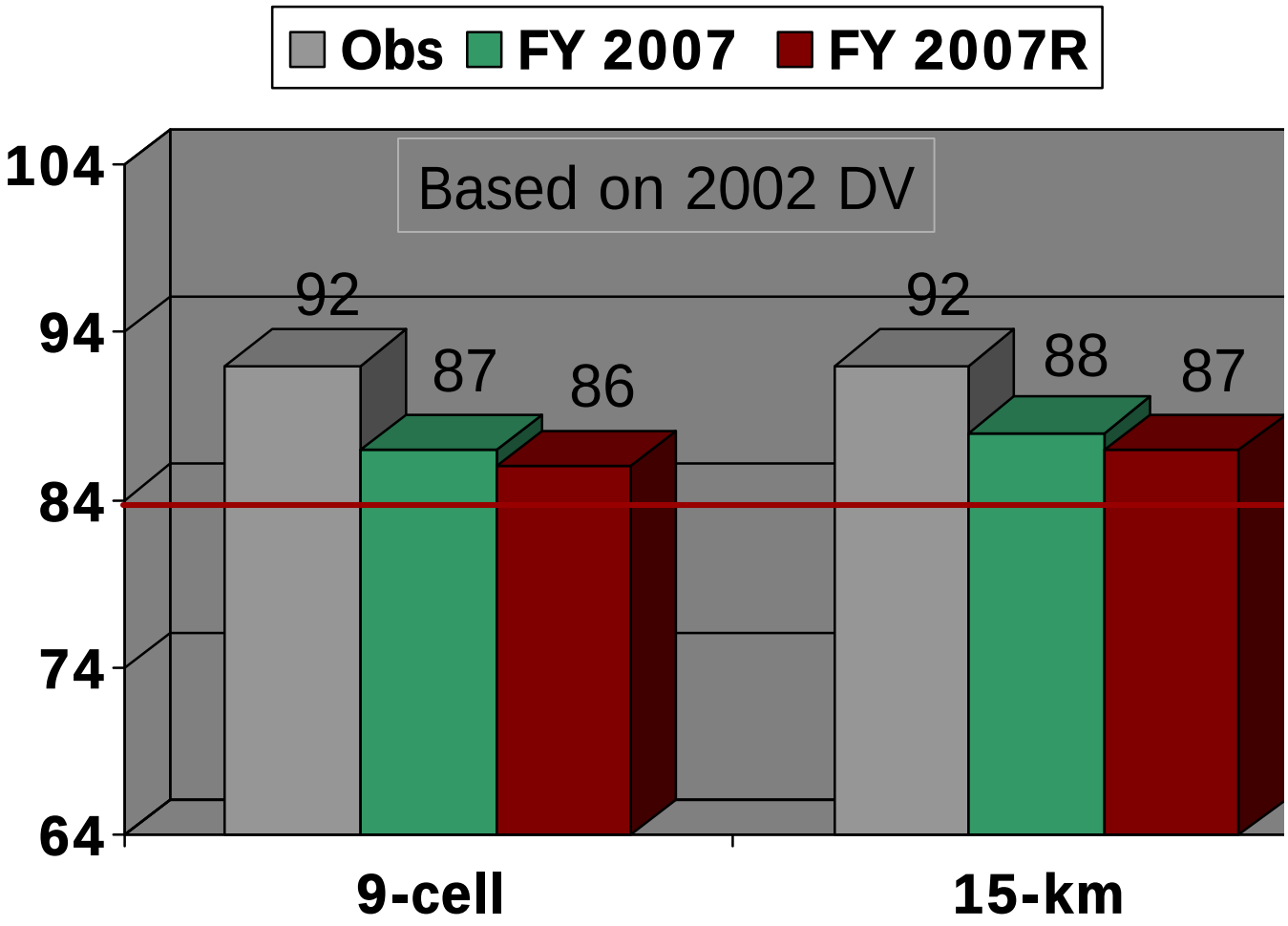


ESTIMATED DESIGN VALUE (EDV
CHATTANOOGA AREA



ppb

ESTIMATED DESIGN VALUE (EDV
TRI-CITIES AREA



ppb

REVISED/ALTERNATE FUTURE-YEAR BASELINE RESULTS

- Compared to the prior baseline, 8-hour oz exceedance exposure is lower by 6% for (3 and ≈15 to 40% for the areas of interes
  - 16% for Memphis EAC area
  - 26% for Nashville EAC area
  - 40% for Knoxville EAC area
  - 14% for Chattanooga EAC area
  - 33% for Tri-Cities EAC area
- EDVs for 2007 are 0-2 ppb lower than for prior baseline for the areas of interest

OVERVIEW OF OXIDANT TAGGING

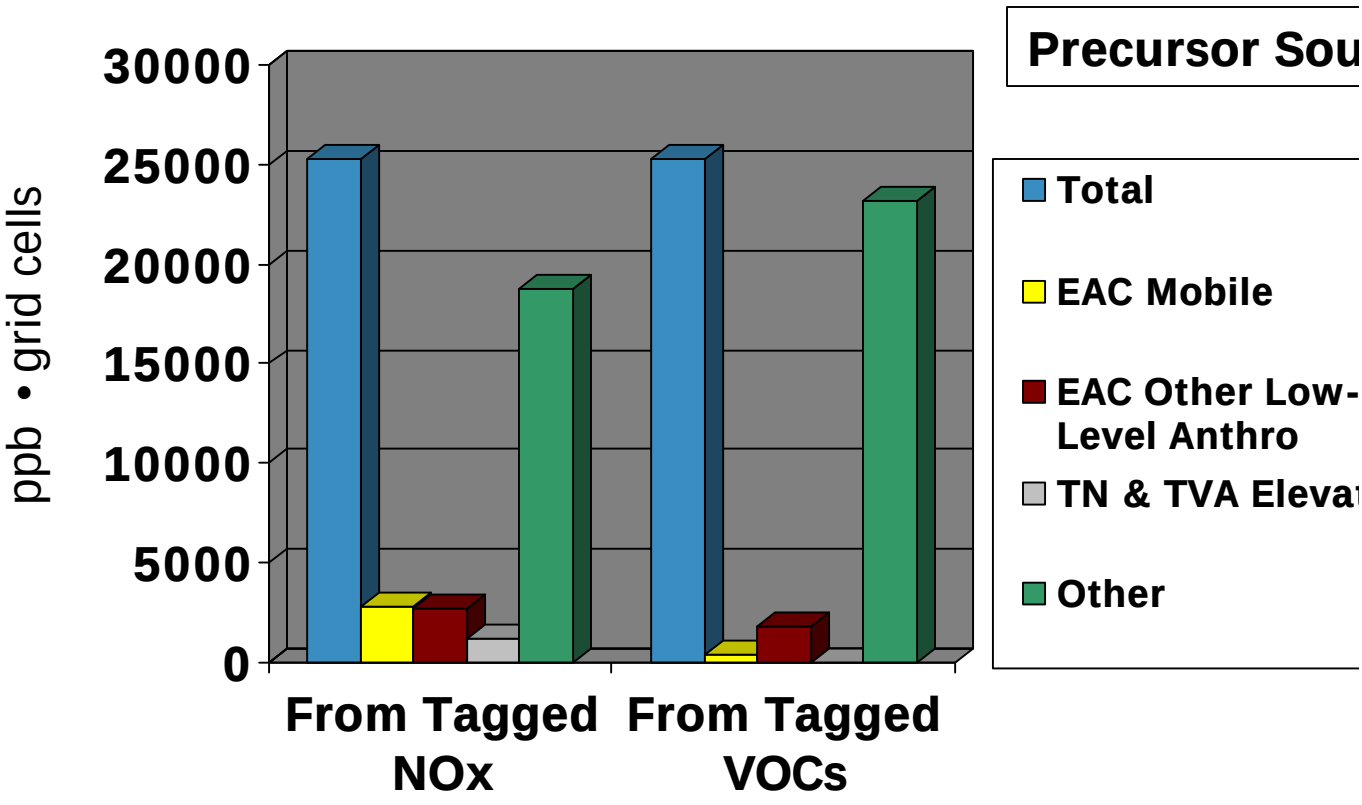
- Feature of UAM-V that allows one to track sources of ozone precursors (according to location or source type)
- Different from other source apportionmen techniques
  - No arbitrary assignment of ozone to VOC or N
- Different from zero-out or emission reduct simulations
  - Examines contribution rather than response
  - Provides direct information on simulated trans

OPTM SCENARIO AT-1: METHODOLOGY

- Applied OPTM using 4 source-category t
  1. On-road mobile-source emissions from five E areas (Memphis, Nashville, Knoxville, Chattanooga, Tri-Cities)
  2. Other low-level emissions from five EAC area
  3. Elevated point-source emissions from source TN and all TVA sources
  4. All other emissions (including biogenics)
- Examined contributions to
  - 8-hour ozone exceedance exposure for EAC
  - Maximum simulated 8-hour ozone values for selected monitoring sites (and key days)

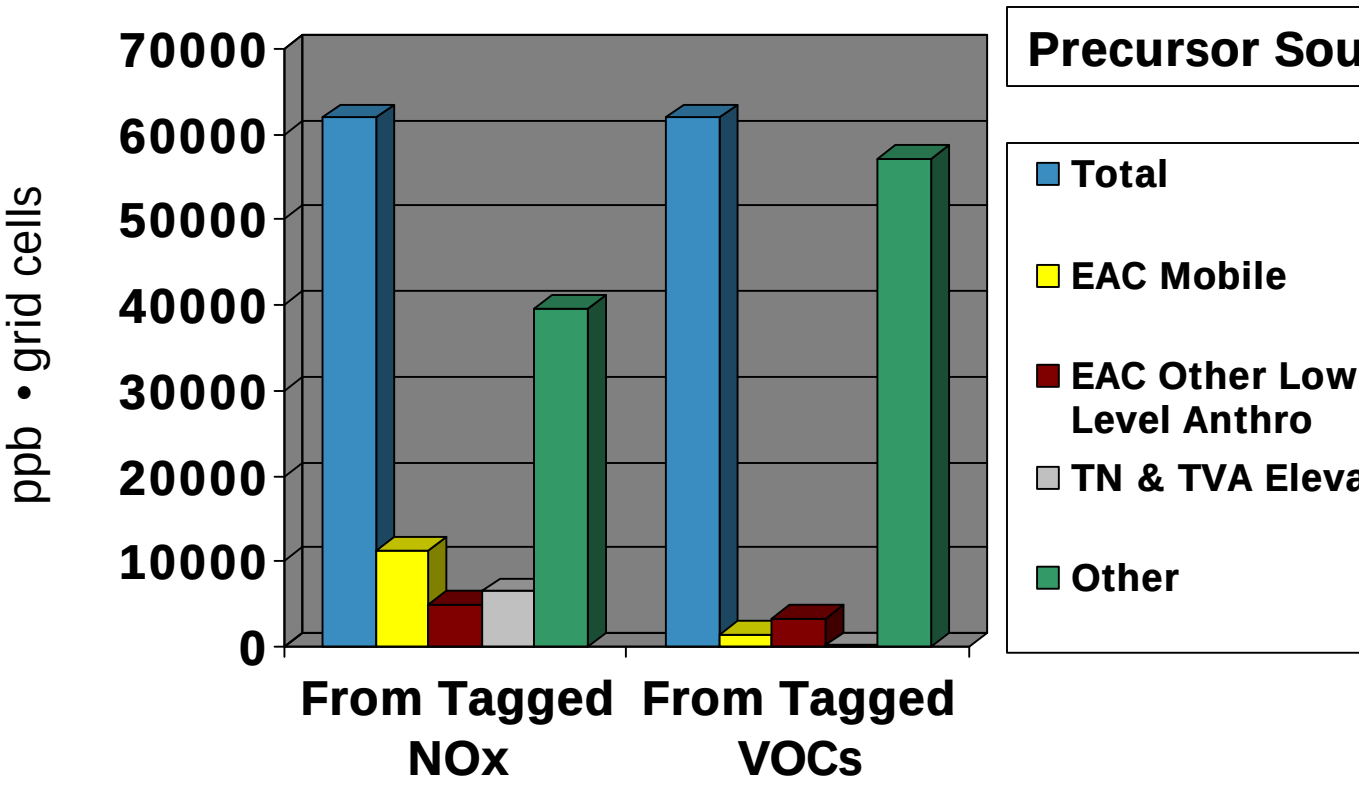
TOTAL 8-HOUR EXCEEDANCE EXPOSURE: MEMPHIS EAC AREA

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



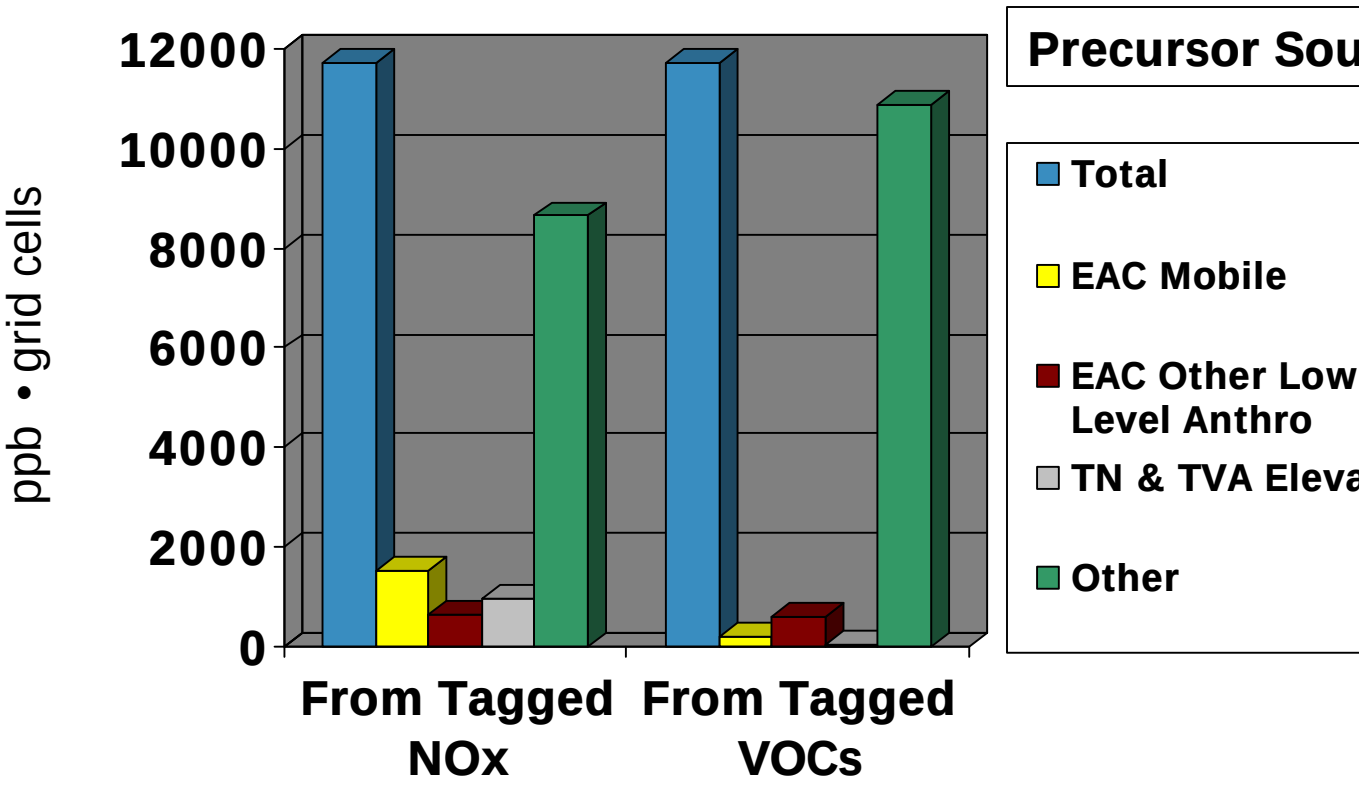
TOTAL 8-HOUR EXCEEDANCE EXPOSURE: NASHVILLE EAC ARE

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



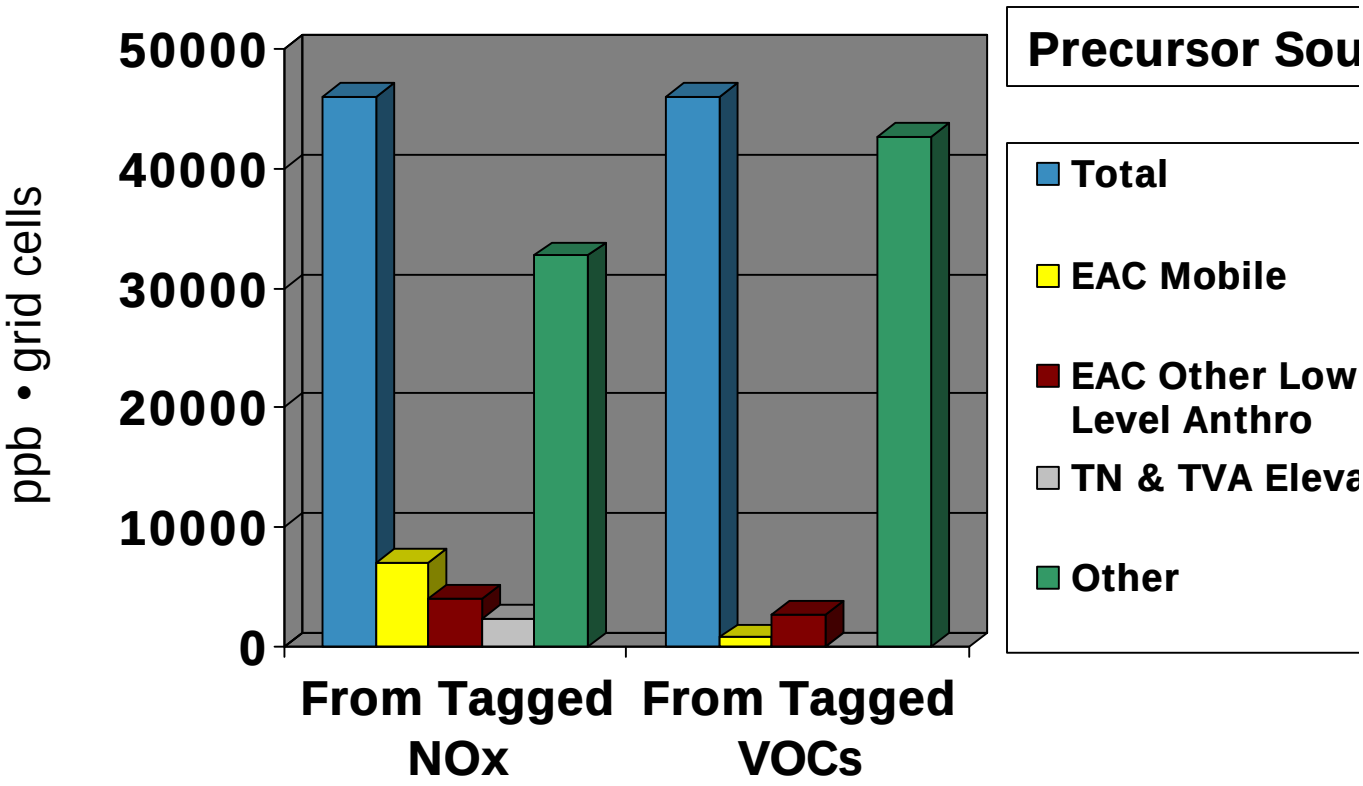
TOTAL 8-HOUR EXCEEDANCE EXPOSURE: KNOXVILLE EAC ARE

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



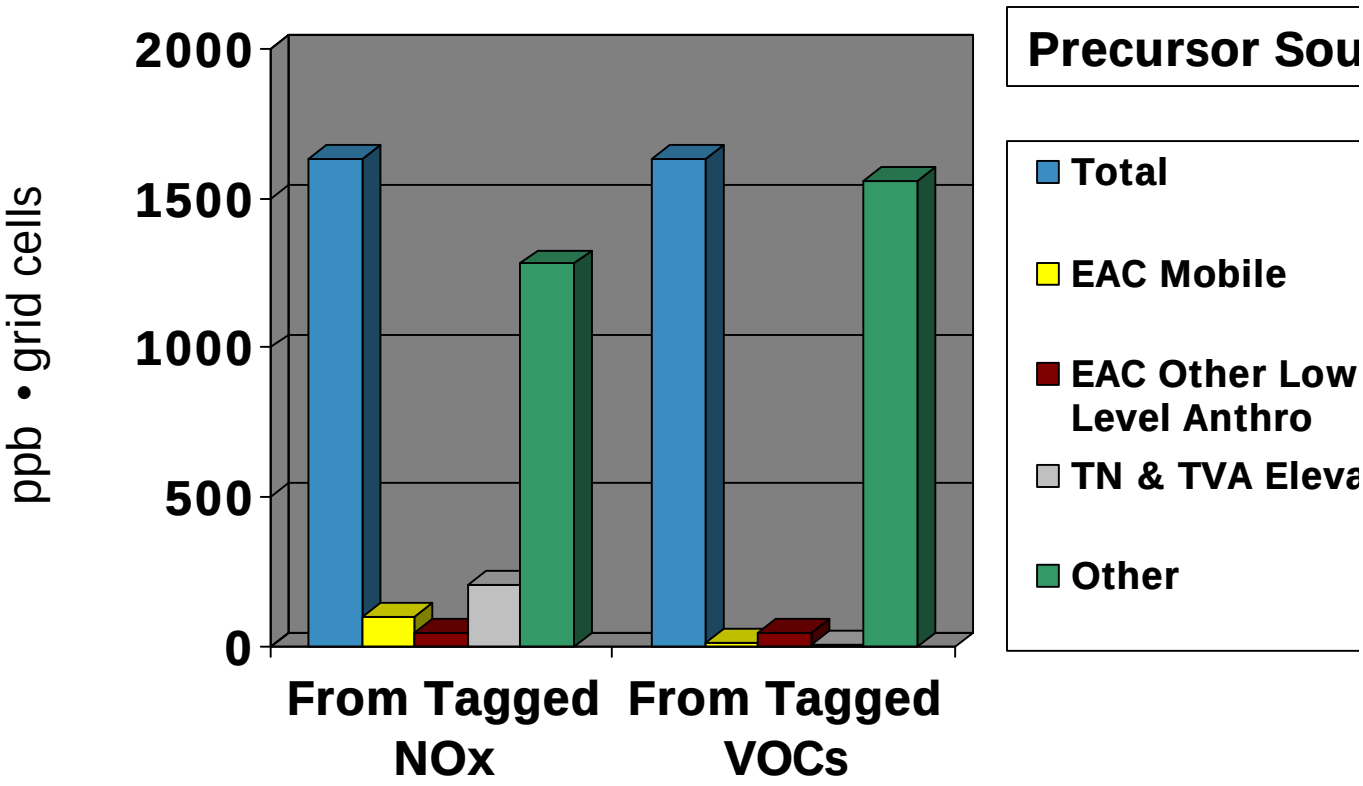
TOTAL 8-HOUR EXCEEDANCE
POSURE: CHATTANOOGA EAC AR

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



TOTAL 8-HOUR EXCEEDANCE XPOSURE: TRI-CITIES EAC AREA

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



SUMMARY OF OPTM AT-1 RESULTS

- On-road mobile-source NOx emissions are import for all areas
- Other low-level NOx emissions contribute less tha on-road mobile, but other low-level VOC emissior tend to be more important than mobile VOCs
- Contribution from elevated NOx is typically less tl that for on-road mobile but greater than that for other low-level NOx sources
- Relative contributions to the maximum 8-hour oz value varies from day to day
- Contribution from all other (including biogenic) sources ranges from about 50 – 80% for NOx an from about 80-100% for VOC

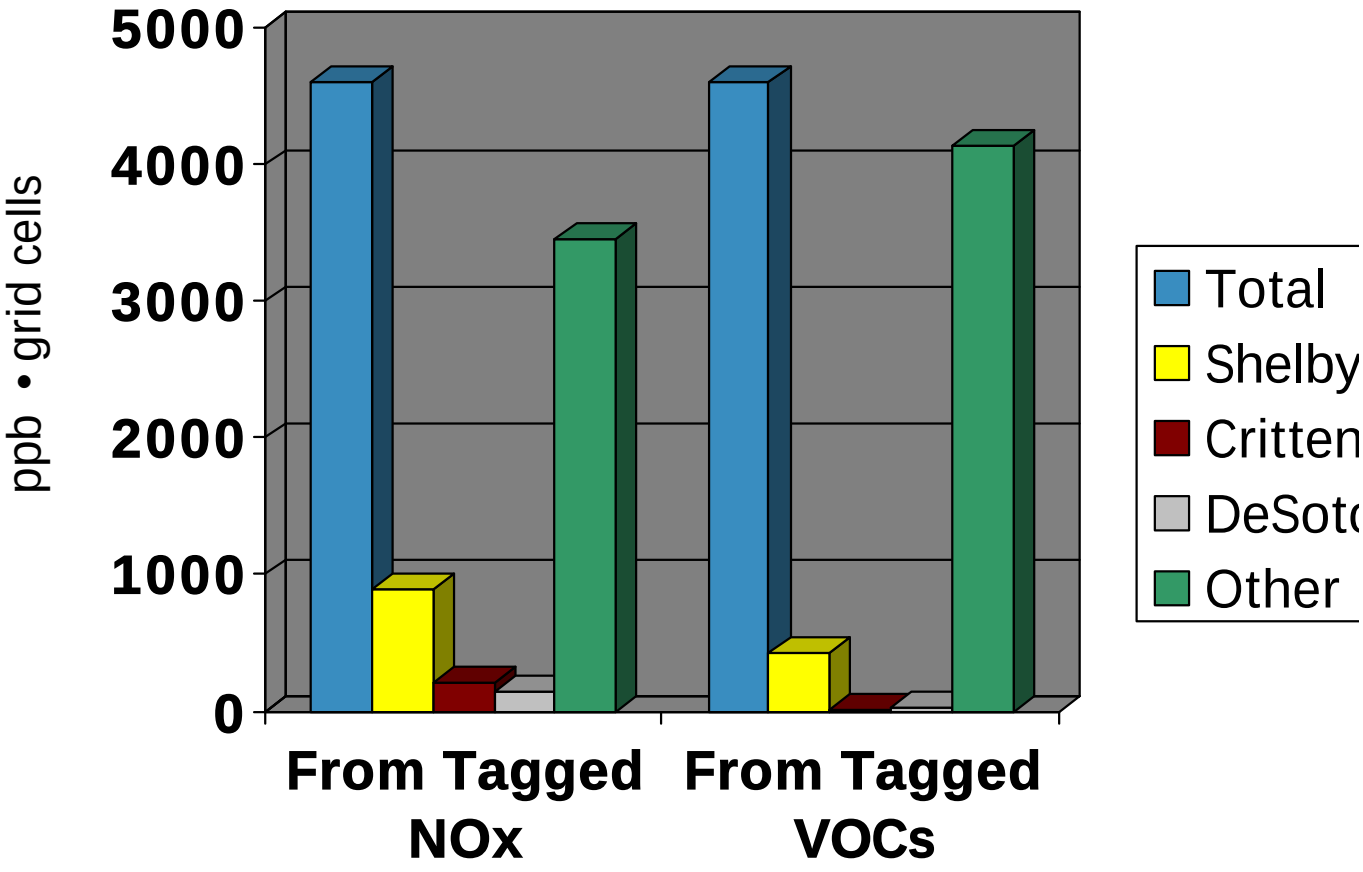
Tagging animations – AT-1

OPTM SCENARIO AT-2: METHODOLOGY

- Applied OPTM using 4 source-category t
  1. Anthropogenic emissions from Shelby Co. sc
  2. Anthropogenic emissions from Crittenden Co sources
  3. Anthropogenic emissions from DeSoto Co. sources
  4. All other emissions (including biogenics)
- Examined contributions to
  - 8-hour ozone exceedance exposure for Mem area counties
  - Maximum simulated 8-hour ozone values for selected monitoring sites (and key days)

TOTAL 8-HOUR EXCEEDANCE EXPOSURE: SHELBY CO.

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



TOTAL 8-HOUR EXCEEDANCE EXPOSURE: SHELBY CO.

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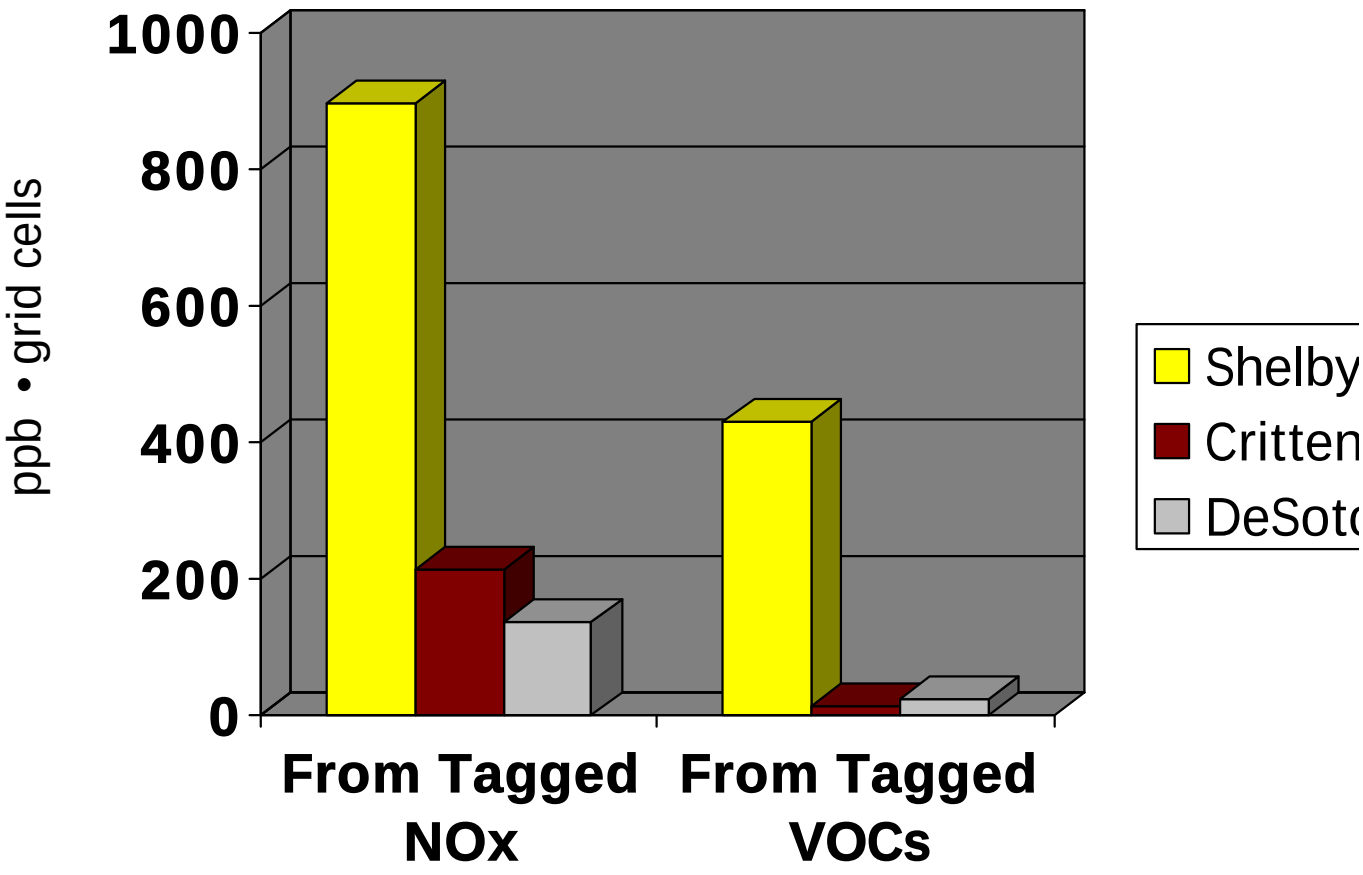
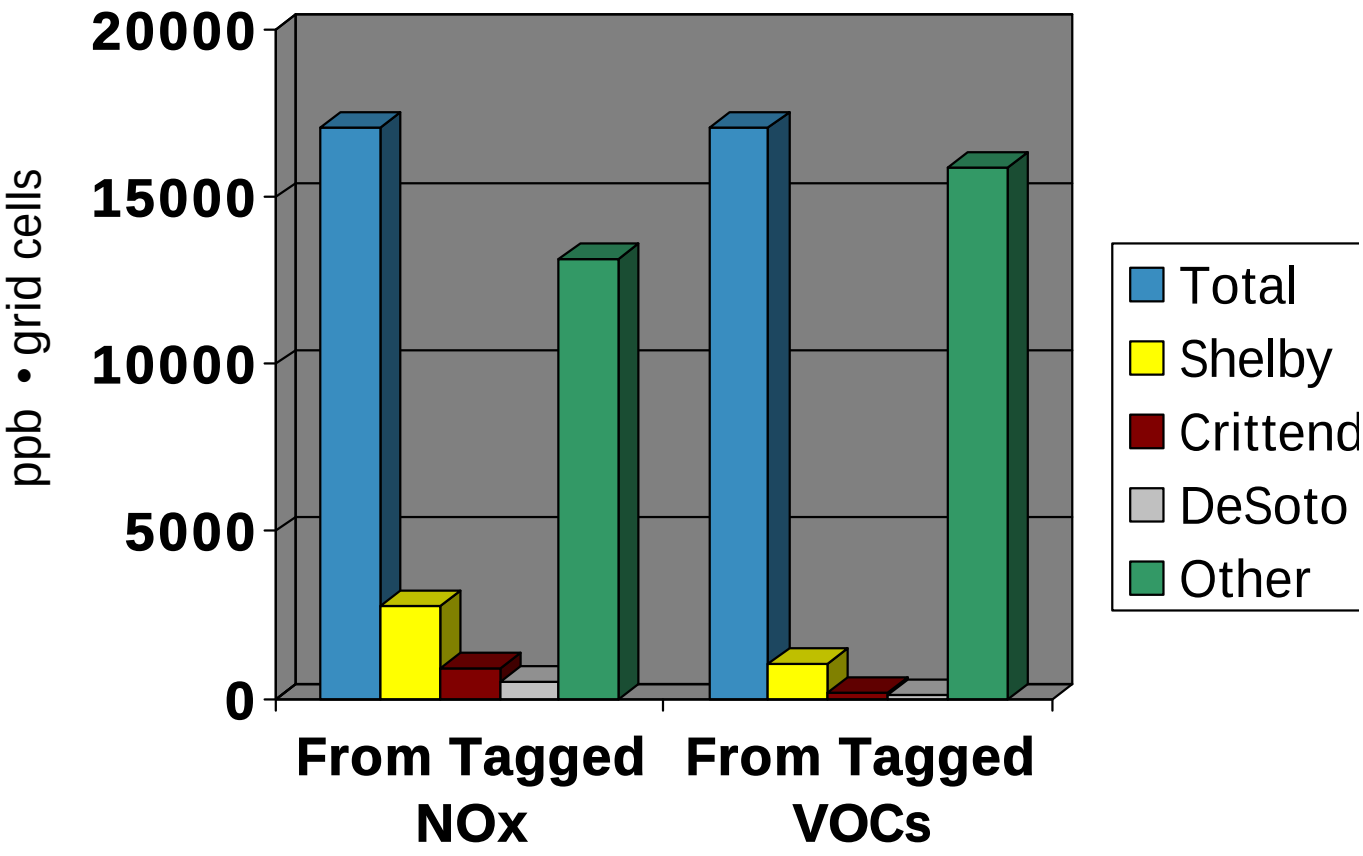


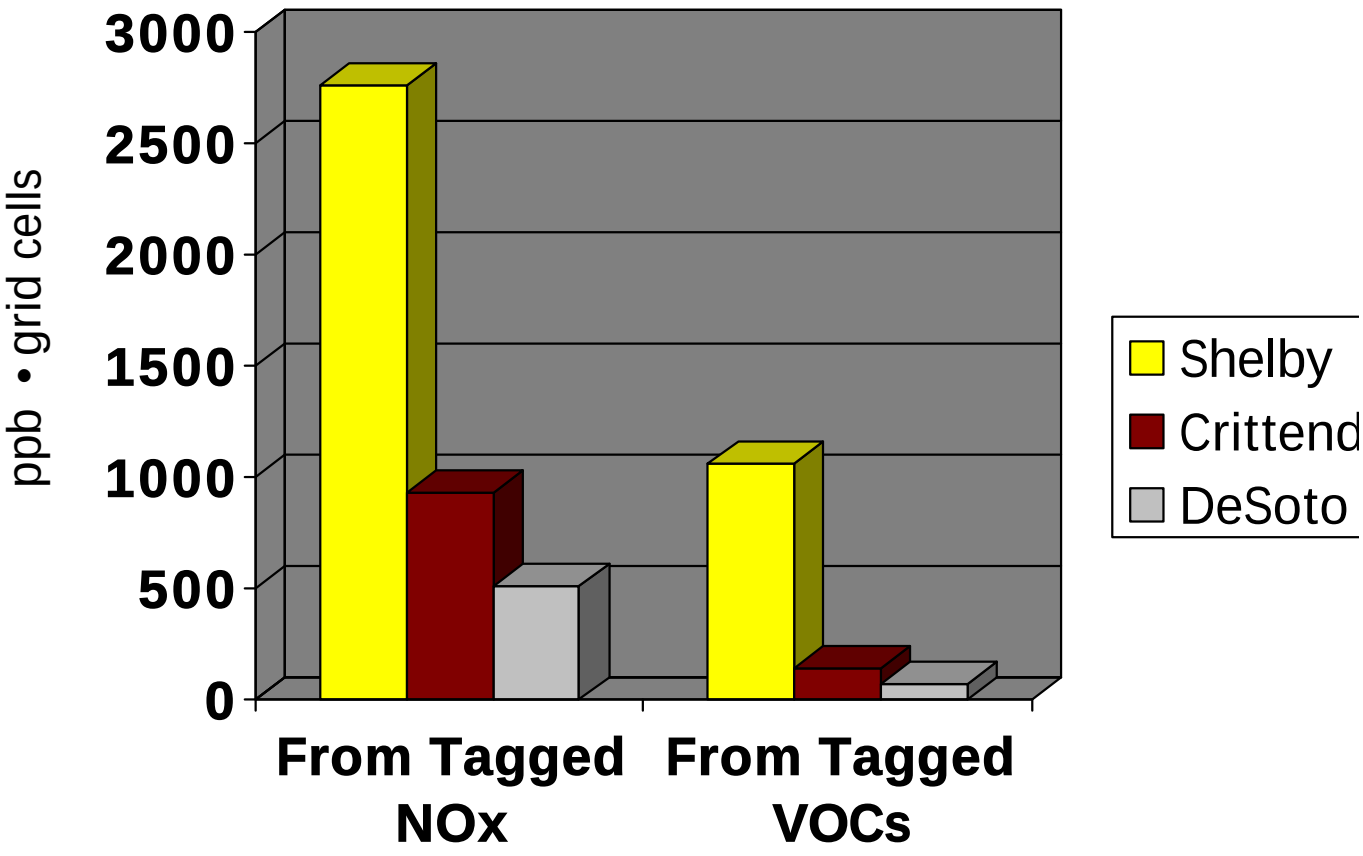
TOTAL 8-HOUR EXCEEDANCE EXPOSURE: CRITTENDEN CO.

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



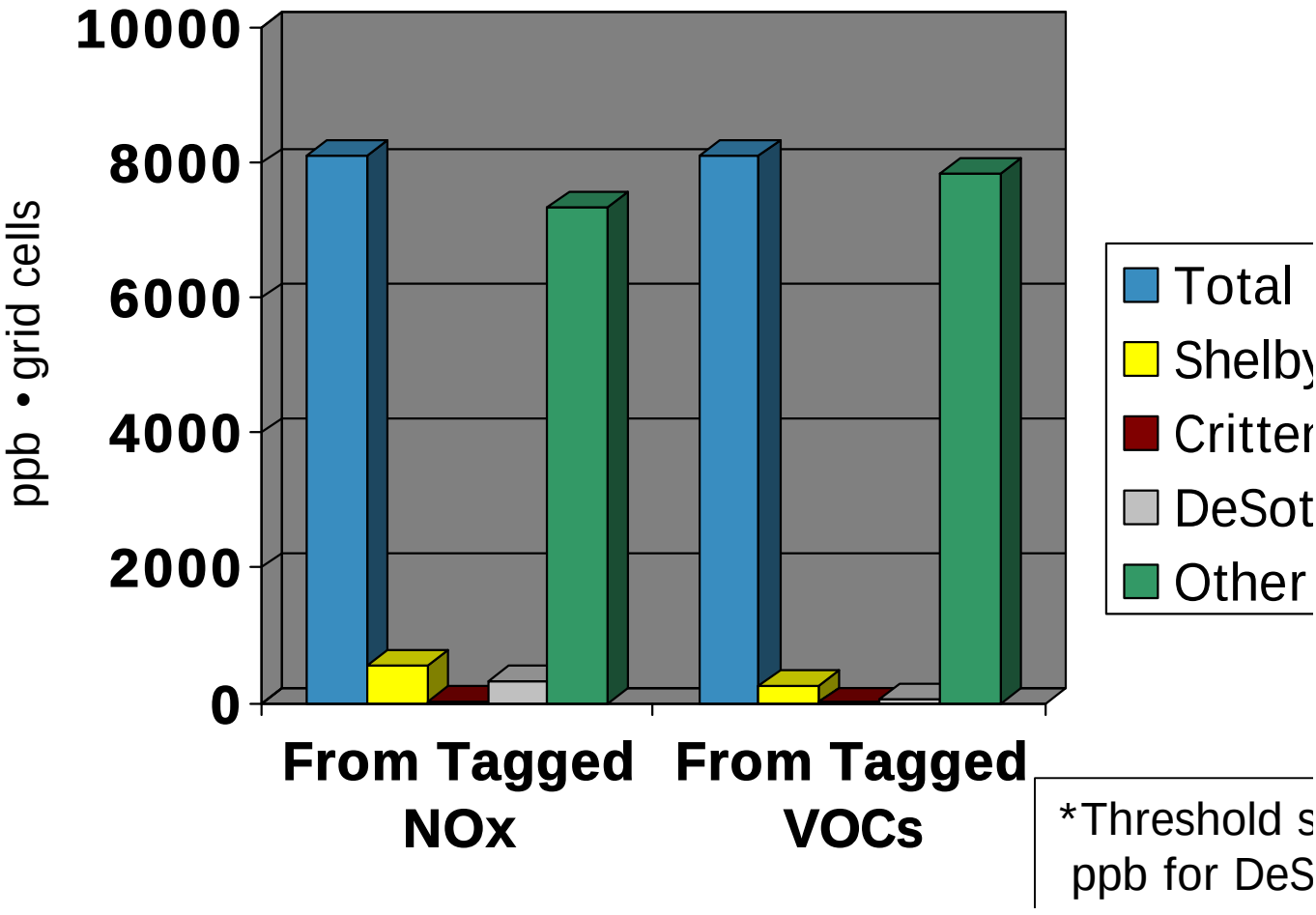
TOTAL 8-HOUR EXCEEDANCE EXPOSURE: CRITTENDEN CO.

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



TOTAL 8-HOUR EXCEEDANCE* EXPOSURE: DESOTO CO.

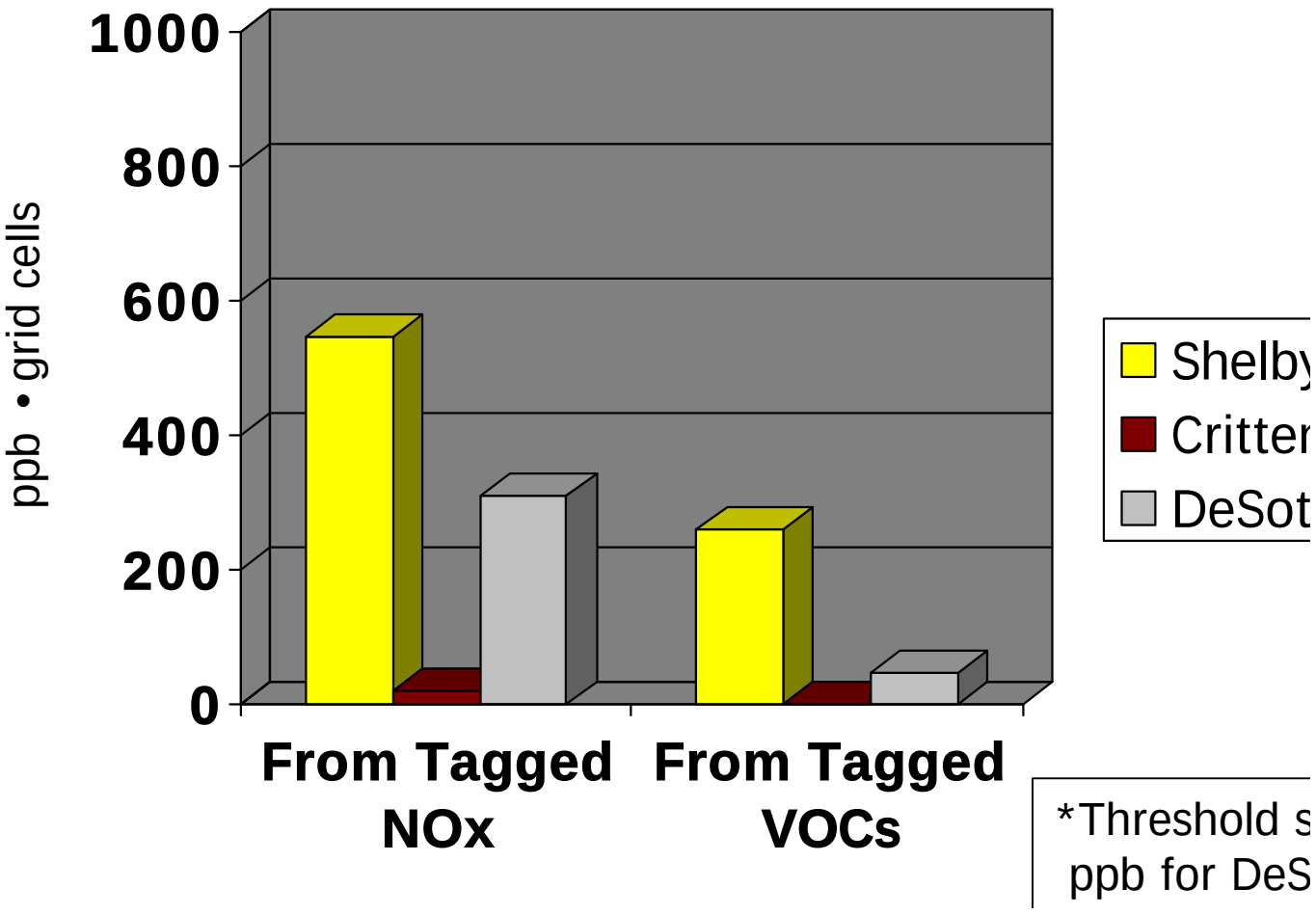
Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



*Threshold s
ppb for DeS

TOTAL 8-HOUR EXCEEDANCE* EXPOSURE: DESOTO CO.

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



SUMMARY OF OPTM AT-2 RESULTS

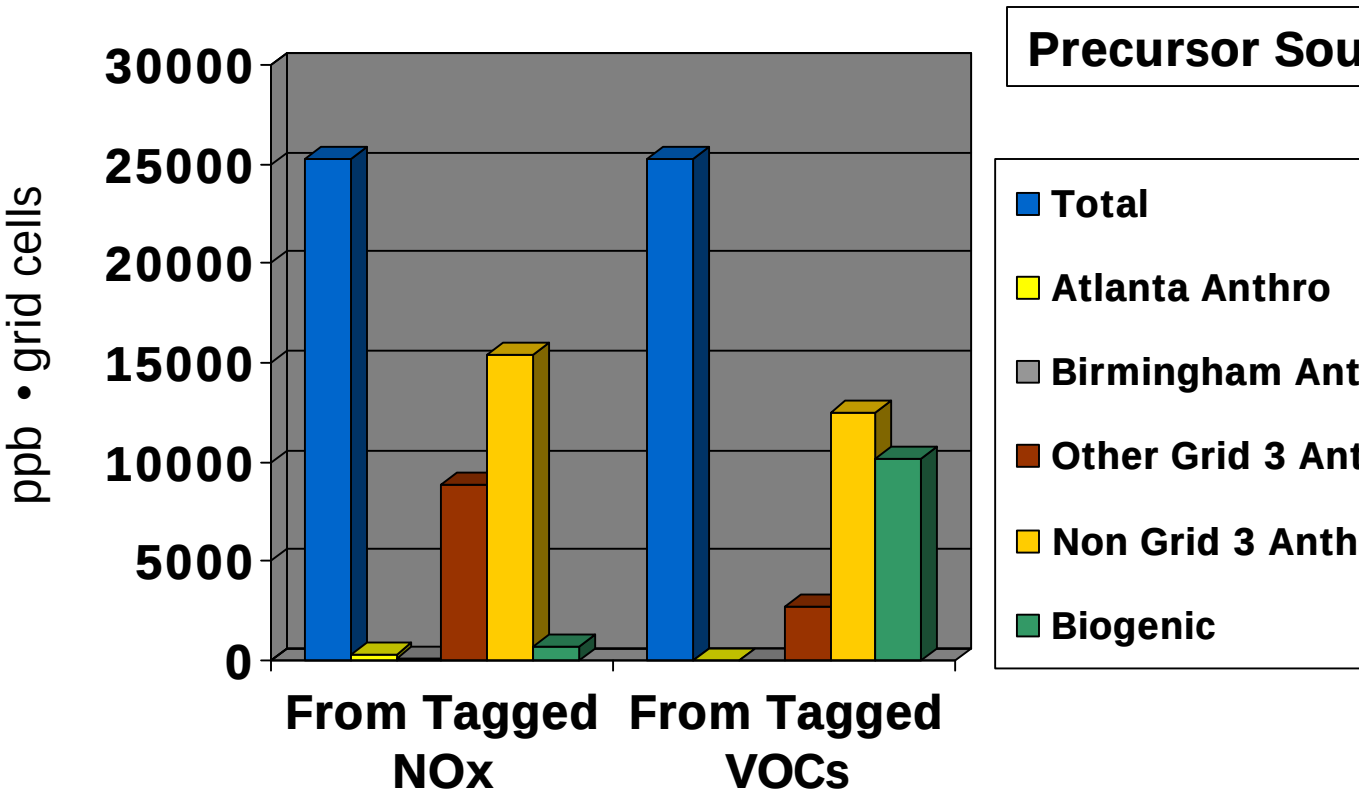
- For the ATMOS simulation days, emissions from Shelby Co. contribute to 8-hour ozon Shelby, Crittenden, and DeSoto Co.
- Local (same-county) emissions are also important, especially during peak 8-hour ozone periods
- Background and transported ozone and precursors are important factors for all thr counties

OPTM SCENARIO AT-3: METHODOLOGY

- Applied OPTM using 5 tags
  1. Anthropogenic emissions from the Atlanta (4 county) area
  2. Anthropogenic emissions from the Birmingha county) area
  3. All other anthropogenic emissions from Grid
  4. All other anthropogenic emissions
  5. Biogenic emissions
- Examined contributions to
  - 8-hour ozone exceedance exposure for EAC
  - Maximum simulated 8-hour ozone values for selected monitoring sites (and key days)

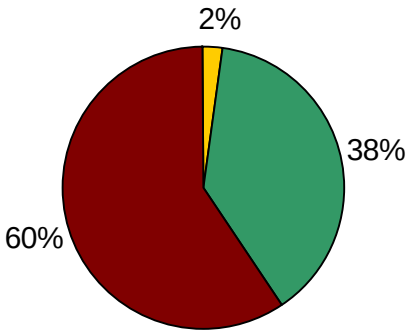
TOTAL 8-HOUR EXCEEDANCE EXPOSURE: MEMPHIS EAC AREA

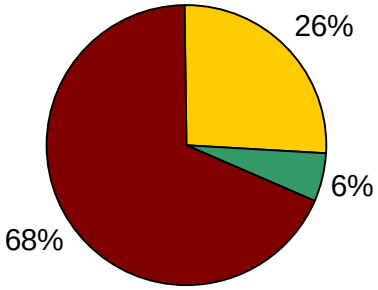
Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



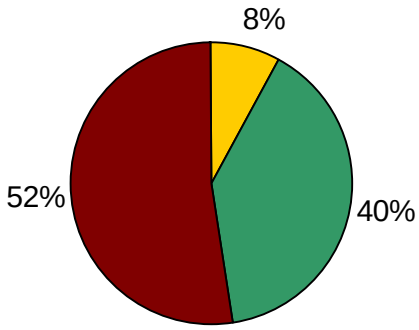
EDMUND ORGILL PARK
MAX 8-HR O3 FROM VOC/NOX

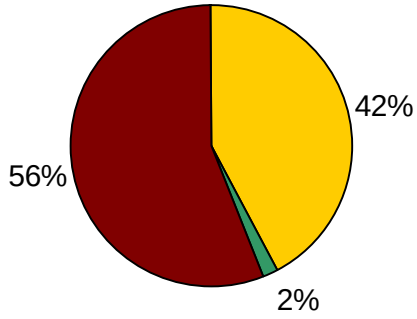
12:00 June 18





12:00 June 20



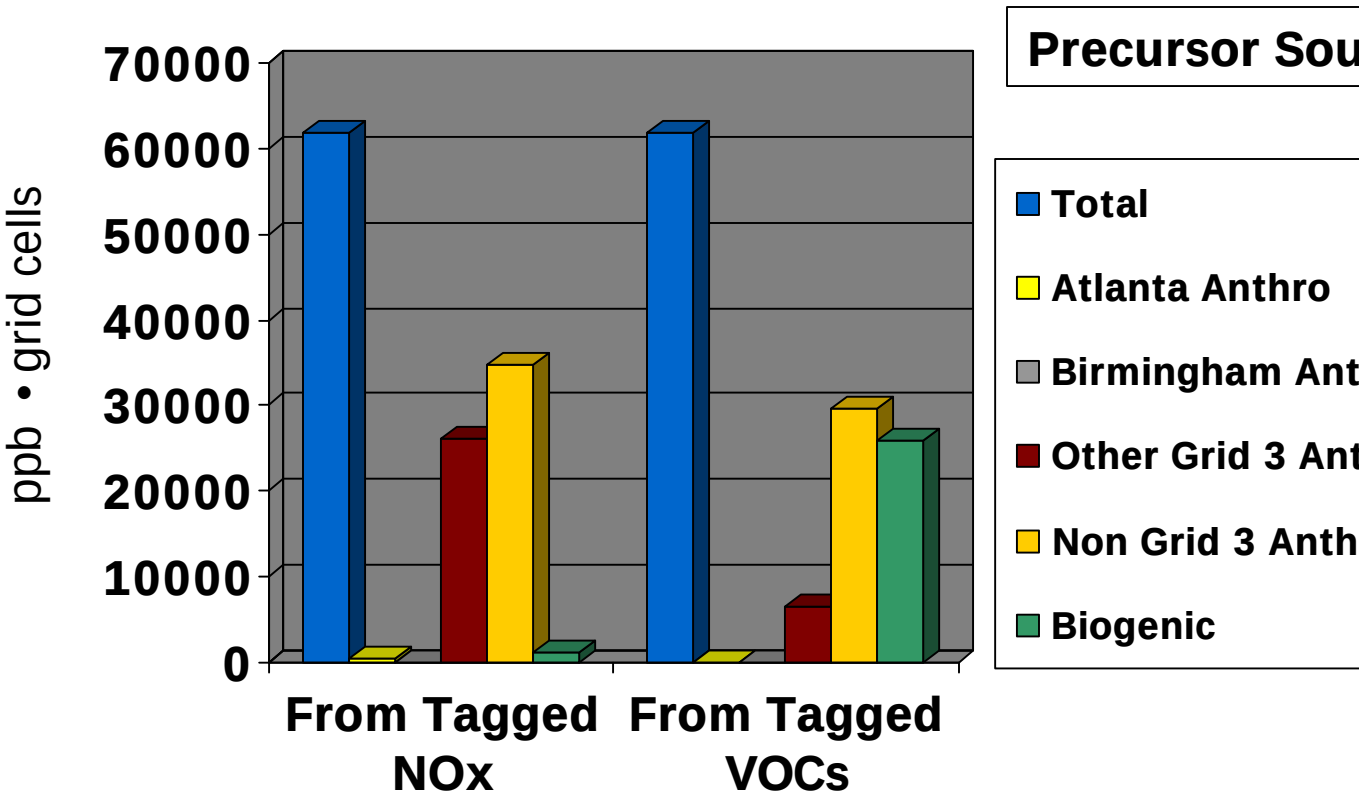


Emissions: Atlanta area | Birmingham area | Other

Emissions: Biogenic | Other Anthro., Initial and Bou

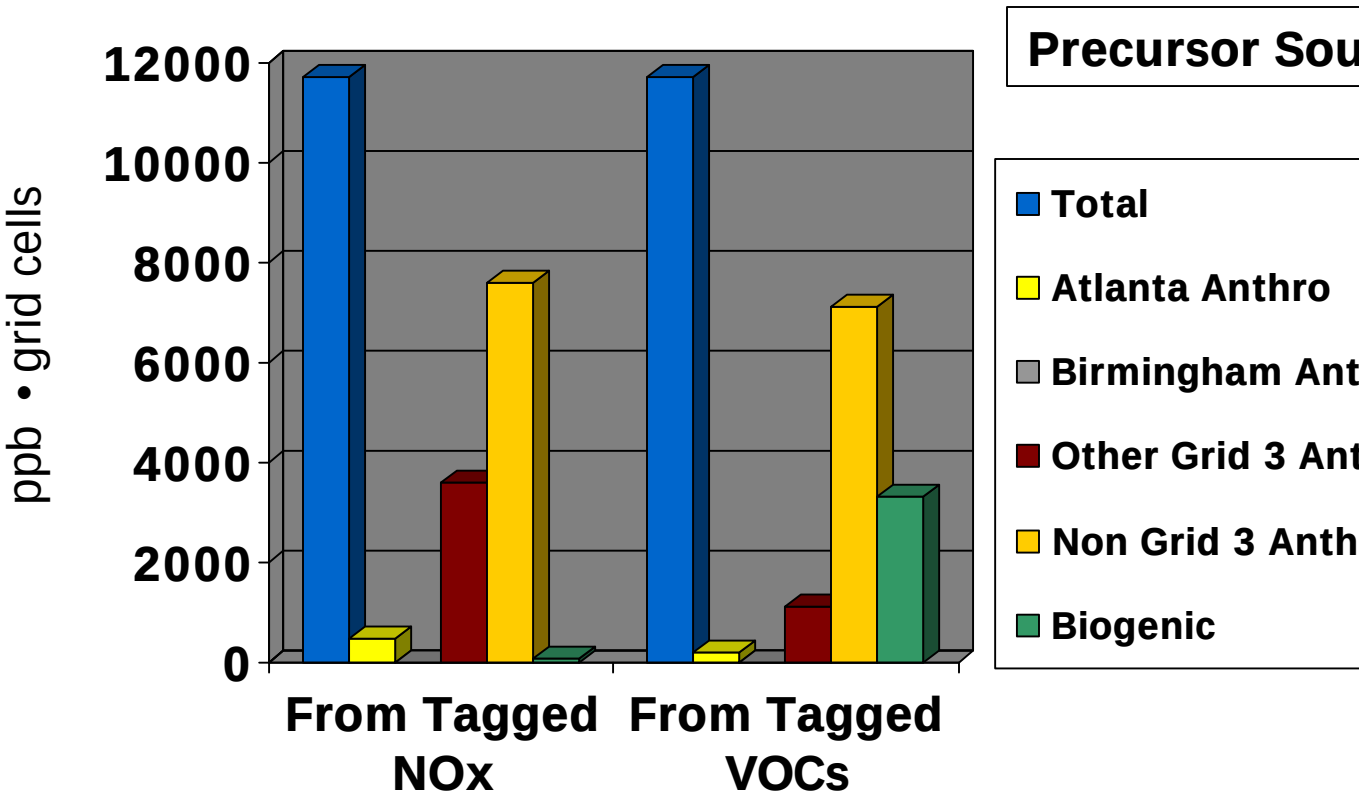
TOTAL 8-HOUR EXCEEDANCE EXPOSURE: NASHVILLE EAC AREA

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



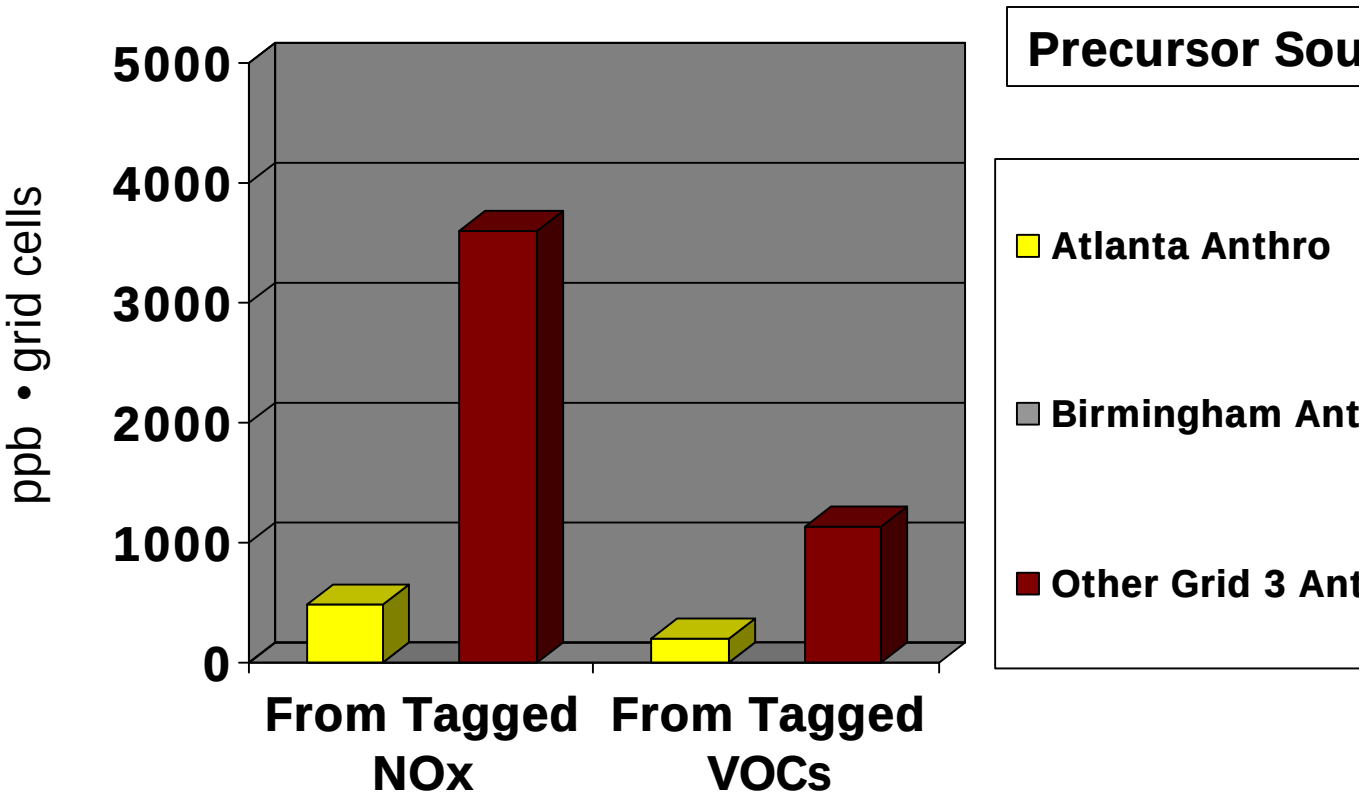
TOTAL 8-HOUR EXCEEDANCE EXPOSURE: KNOXVILLE EAC AREA

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



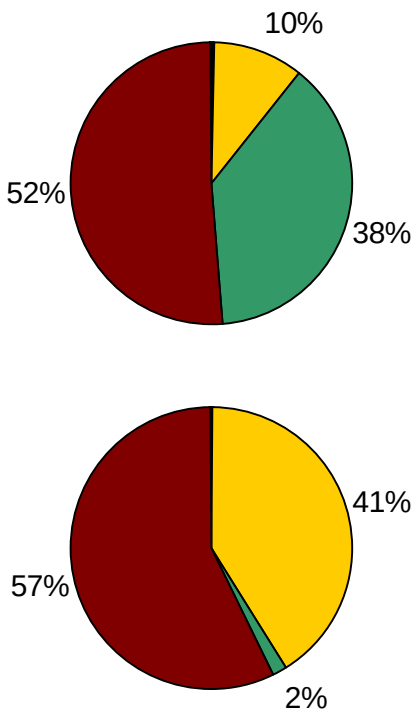
TOTAL 8-HOUR EXCEEDANCE EXPOSURE: KNOXVILLE EAC AREA

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas

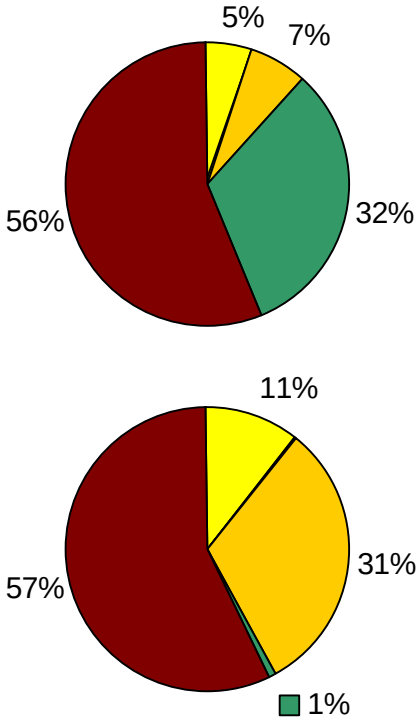


EAST KNOX
MAX 8-HR O3 FROM VOC/NOX

11:00 June 19



10:00 June 20

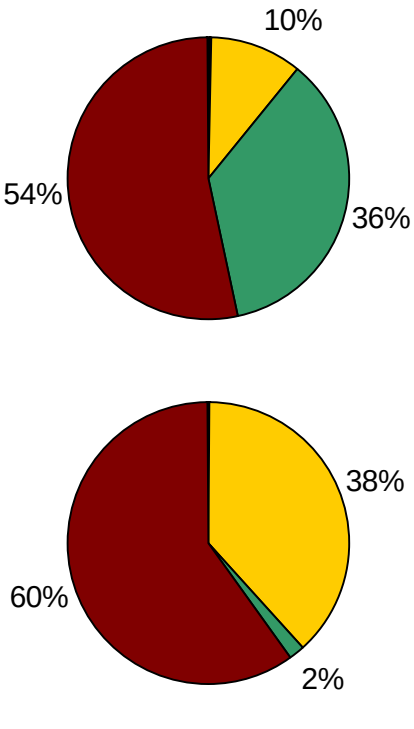


. Emissions: **Atlanta area** **Birmingham area** **Other**

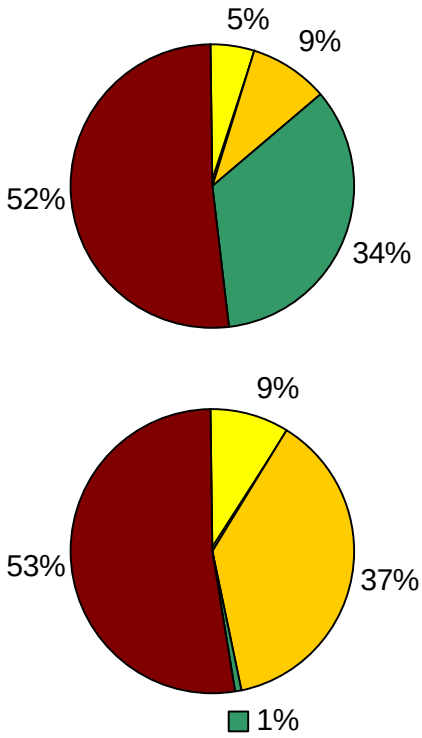
Emissions: **Biogenic** **Other Anthro., Initial and Bou**

SPRING HILL
MAX 8-HR O3 FROM VOC/NOX

10:00 June 19



11:00 June 20

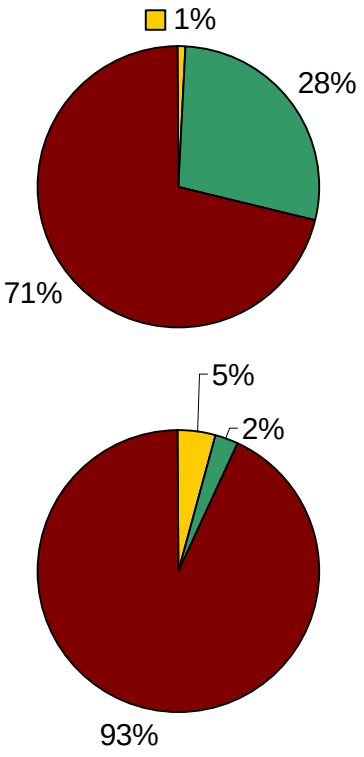


. Emissions: Atlanta area | Birmingham area | Other

Emissions: Biogenic | Other Anthro., Initial and Bou

CLINGMAN'S DOME
MAX 8-HR O3 FROM VOC/NOX

0:00 June 19



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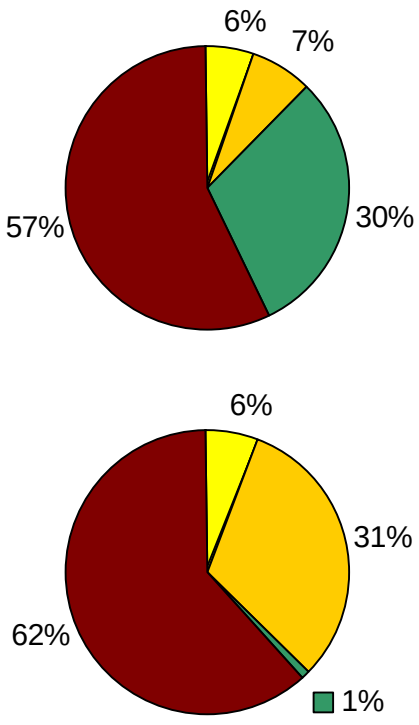
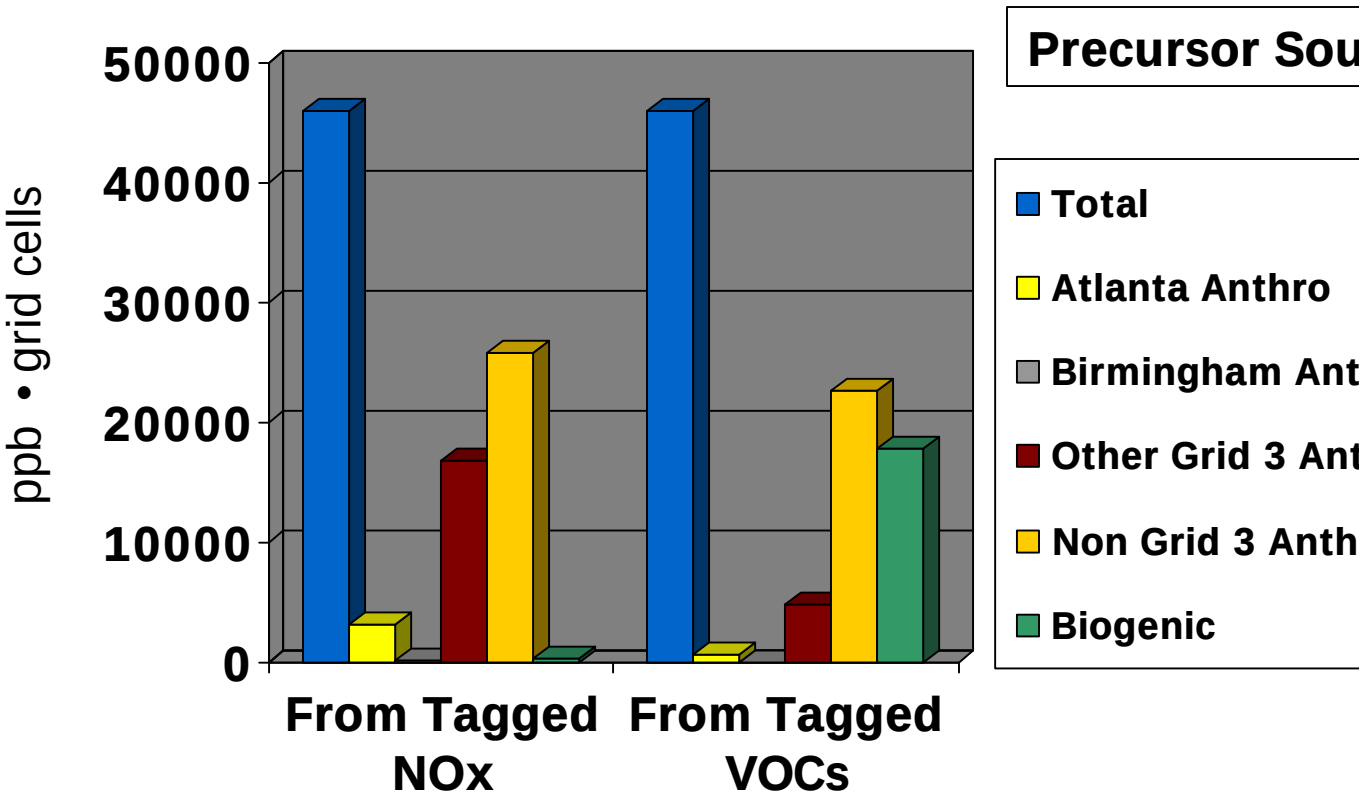


Emissions: Atlanta area | Birmingham area | Other

Emissions: Biogenic | Other Anthro., Initial and Bou

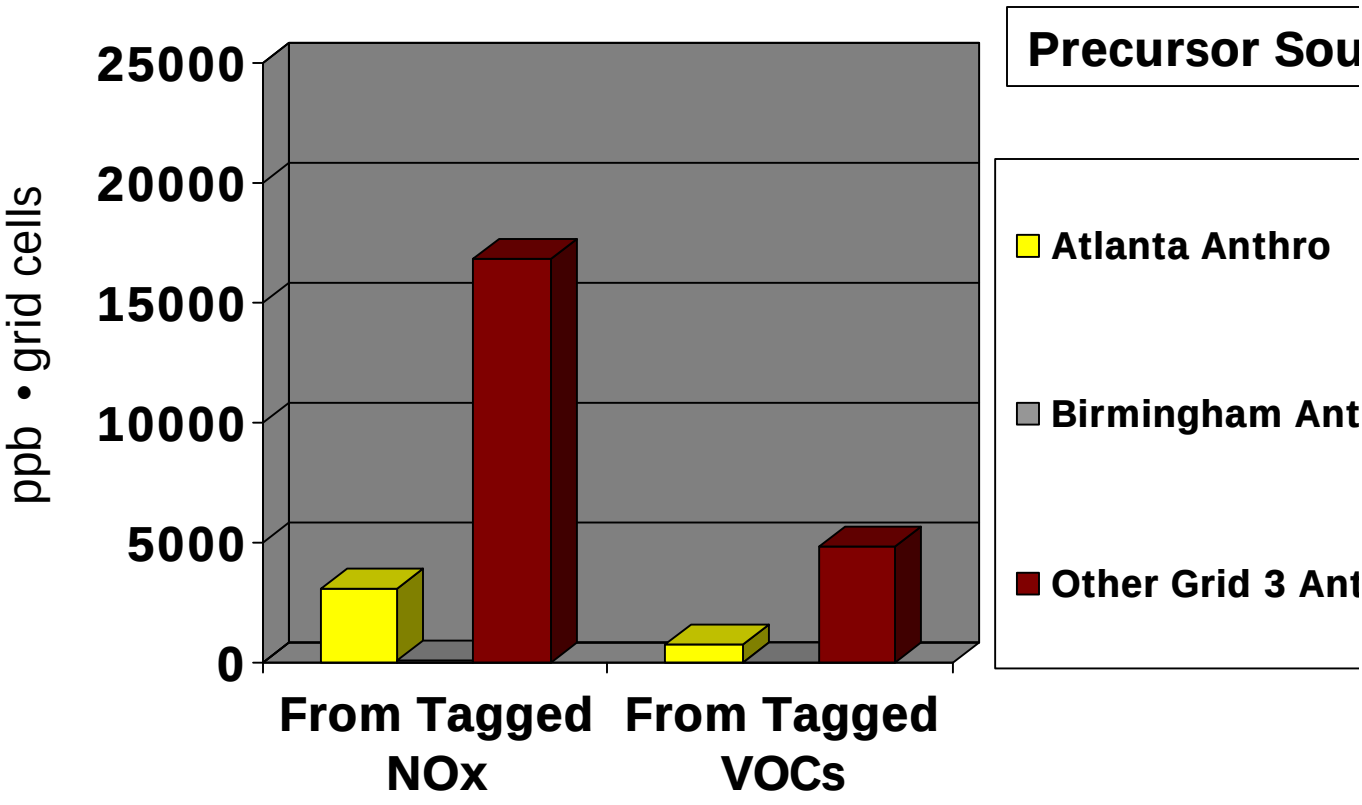
TOTAL 8-HOUR EXCEEDANCE
POSURE: CHATTANOOGA EAC AF

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



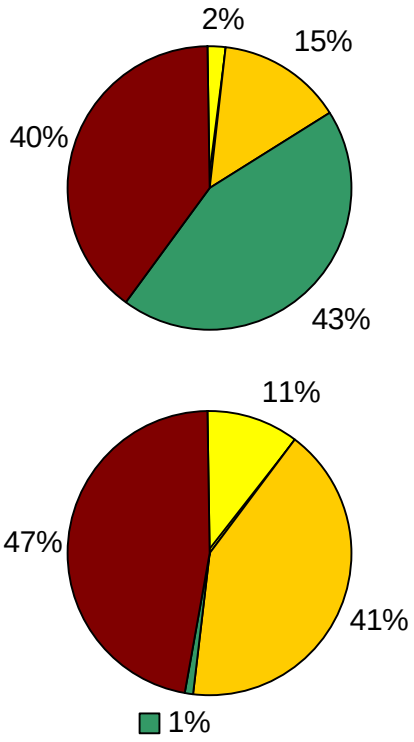
TOTAL 8-HOUR EXCEEDANCE
POSURE: CHATTANOOGA EAC AF

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas

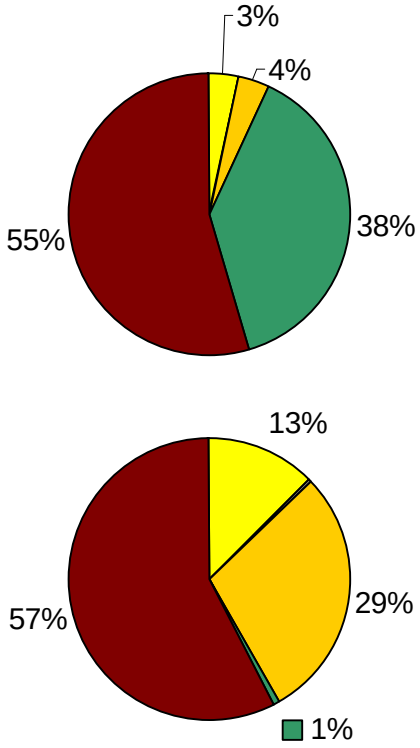


SEQUOYAH
MAX 8-HR O3 FROM VOC/NOX

10:00 Sep. 4



11:00 June 19

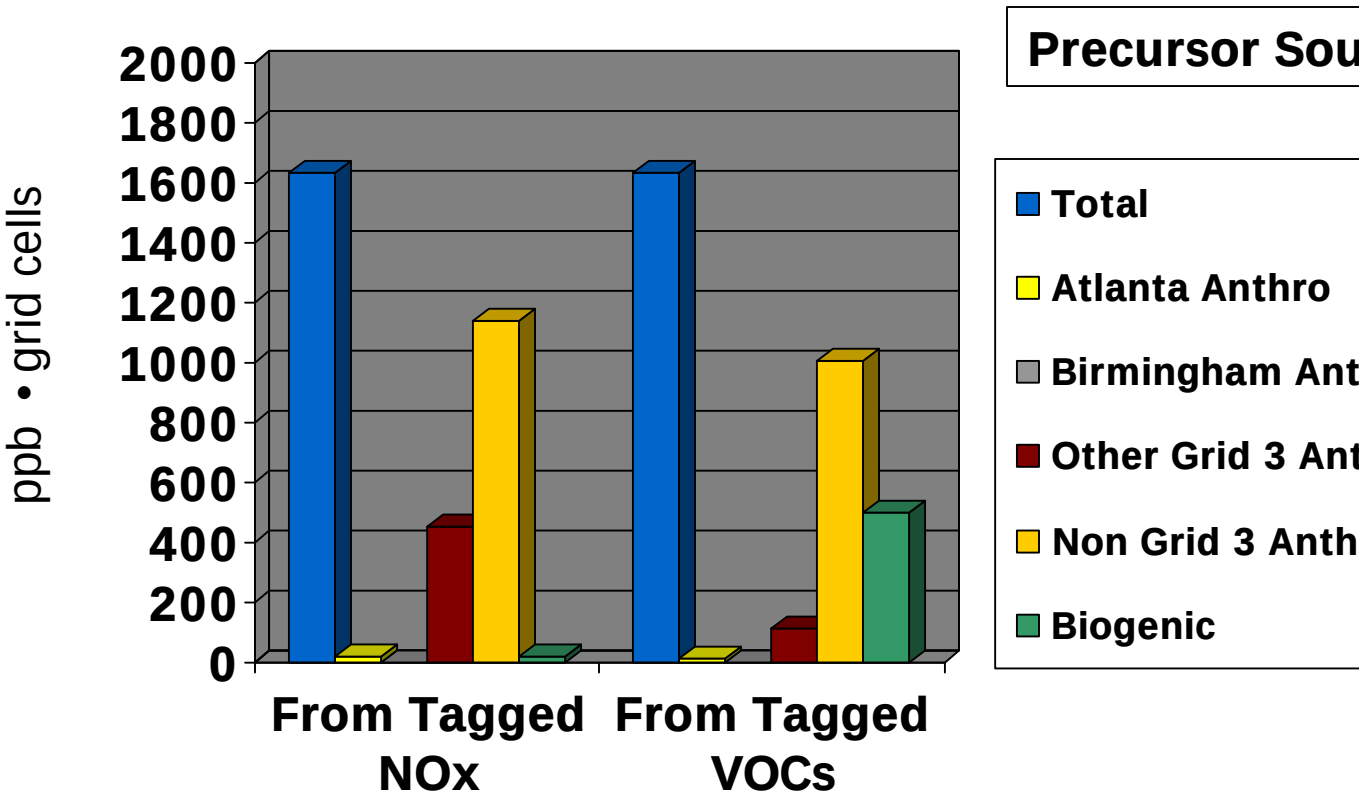


. Emissions: Atlanta area | Birmingham area | Other

Emissions: Biogenic | Other Anthro., Initial and Bou

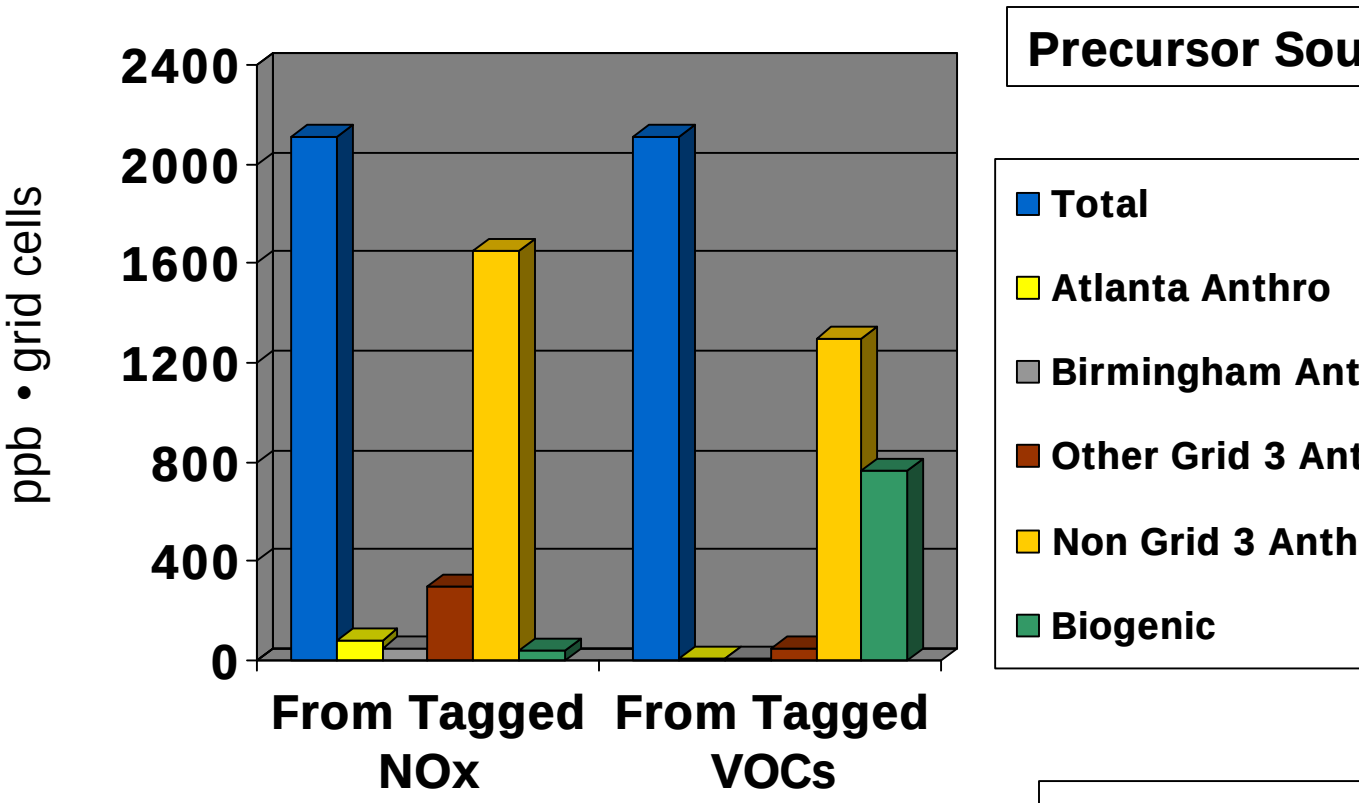
TOTAL 8-HOUR EXCEEDANCE EXPOSURE: TRI-CITIES EAC AREA

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



TOTAL 8-HOUR EXCEEDANCE* EXPOSURE: LEE CO., MS

Aug/Sep (1999) and June (2001) Simulation Periods Combined: 2007 Bas



*Threshold se
ppb for Lee (

SUMMARY OF OPTM AT-3 RESULTS

- Atlanta metropolitan area contributes to o exceedances in Knoxville and Chattanooga
  - Of the NOx contributing to the 8-hour exceeda exposure, about 20% overall is attributed to emissions from Atlanta
  - Of the NOx contributing to the peak 8-hour va about 5-15% is attributed to Atlanta on certai exceedance days
- Background and transported ozone and precursors are important factors for all are
- Approximately 40 – 60% of the ozone is attributed to biogenic VOC emissions

Tagging animations – AT-3

EMISSION-REDUCTION SCENARIO AS-1

- Applied the following reductions
  - 5% reduction in low-level and elevated NOx VOC, and CO for Memphis, Nashville (except Davidson Co.), Knoxville, and Tri-Cities EAC areas
  - 1-5% reductions for Davidson Co. (varies by source category)
  - 5% reduction in area-source emissions only Chattanooga EAC area

SUMMARY OF AS-1 RESULTS

- 8-hour ozone exceedance exposure is low by approximately 10% for all areas of interest, with the exception of Chattanoog
- EDVs are lower by 1 ppb for the Memphis Nashville, and Knoxville areas and unchan for the Chattanooga and Tri-Cities areas

EMISSION-REDUCTION SCENARI
AS-2: "ALL MEASURES"

- Simulation conducted to assess the effects of emission reductions from all viable measures included in all EAC areas from:
  - Area sources
  - Non-road sources
  - On-road mobile sources
  - Point sources

EMISSION-REDUCTION SCENARI
AS-2: "ALL MEASURES"

- Area-source measures
  - Open burning ban – residential garbage
  - Open burning ban – yard waste
  - Open burning ban – land clearing
  - Lower gasoline RVP (7.8 to 7.0)
  - Lower gasoline RVP (9.0 to 7.8)
  - Stage I vapor recovery
  - Stage II vapor recovery
  - Ozone action day measures

EMISSION-REDUCTION SCENARI
AS-2: "ALL MEASURES"

- Non-road source measures
  - Construction equipment (X% new)
  - Airport vehicles (Y% new)

EMISSION-REDUCTION SCENARI
AS-2: "ALL MEASURES"

- On-road source measures
  - Inspection/maintenance (OBD only)
  - Intelligent transportation systems
  - Lower interstate truck speeds 10 mph
  - Truck stop electrification (X% of sites)
  - Cetane added to diesel
  - Anti-idling restrictions
  - Transit (increase bus ridership Y%)
  - Voluntary control measures
  - Smoking vehicle ban
  - HOV lane expansion
  - Signal synchronization
  - Low emission fleets
  - New rail service

EMISSION-REDUCTION SCENARI
AS-2: "ALL MEASURES"

- Point source measures
  - NOx RACT rule for sources greater than 50 t

MEMPHIS EAC MEASURES

- Area-source measures
  - Open burning ban – residential garbage
  - Open burning ban – yard waste
  - Open burning ban – land clearing
  - Stage I vapor recovery
  - Ozone action day

MEMPHIS EAC MEASURES (concluded)

- Onroad mobile measures
  - Inspection/maintenance (OBD only)
  - Intelligent transportation systems
  - Lower interstate truck speeds 10 mph
  - Truck stop electrification (10% of sites)
  - Anti-idling restrictions
  - Voluntary control measures
- Point source measures
  - NOx RACT on selected sources

DESOTO COUNTY MEASURES

- Area source measures
  - Prohibit open burning on ozone action days
  - Stage I vapor recovery
- Onroad mobile measures
  - Inspection/maintenance (OBD only)
  - Lower RVP (7.8)
  - Anti-idling restrictions
  - HOV lane continuation
- Point source measures
  - NOx RACT on selected sources
  - VOC reductions on selected sources

CRITTENDEN COUNTY MEASURE

- Area source measures
  - Open burning ban (garbage/yard waste)
  - Lower RVP (7.8 to 7.0)
  - Stage I vapor recovery
  - Ozone Action day measures
- Nonroad measures
  - New construction equipment
  - New airport service vehicles
- Onroad mobile measures
  - Lower interstate truck speeds 10 mph
  - Truck stop electrification (10% of sites)
  - Anti-idling restrictions
  - Cetane additive to diesel

NASHVILLE EAC MEASURES

- Area-source measures
  - Open burning ban – residential garbage
  - Open burning ban – yard waste
  - Stage I vapor recovery
  - Lower gasoline RVP
  - AQAD measures

NASHVILLE EAC MEASURES (concluded)

- On-road mobile measures
  - Inspection/maintenance (OBD only)
  - Intelligent transportation systems
  - Lower interstate truck speeds 10 mph
  - Truck stop electrification (10% of sites)
  - Cetane added to diesel
  - Anti-idling restrictions
  - Transit (increase bus ridership)
  - Voluntary control measures
  - Smoking vehicle ban
  - HOV lane expansion
  - Signal synchronization
  - Low emission fleets
  - New rail service
- Point-source measures
  - NOx RACT on selected sources

KNOXVILLE EAC MEASURES

- Area-source measures
  - Open burning ban – residential garbage
  - Open burning ban – yard waste
  - Open burning ban – land clearing
  - Stage I vapor recovery
  - Lower gasoline RVP (9.0 to 7.8)
  - Ozone action day measures
- Non-road
  - Construction equipment (14% new)

KNOXVILLE EAC MEASURES (concluded)

- On-road mobile measures
  - Inspection/maintenance (OBD only)
  - Lower interstate truck speeds 10 mph
  - Truck stop electrification (30% of sites)
  - Cetane added to diesel
  - Anti-idling restrictions
  - Transit (increase bus ridership 5%)
  - Trip reduction programs
  - Traffic flow improvements
- Point-source measures
  - NOx RACT on selected sources

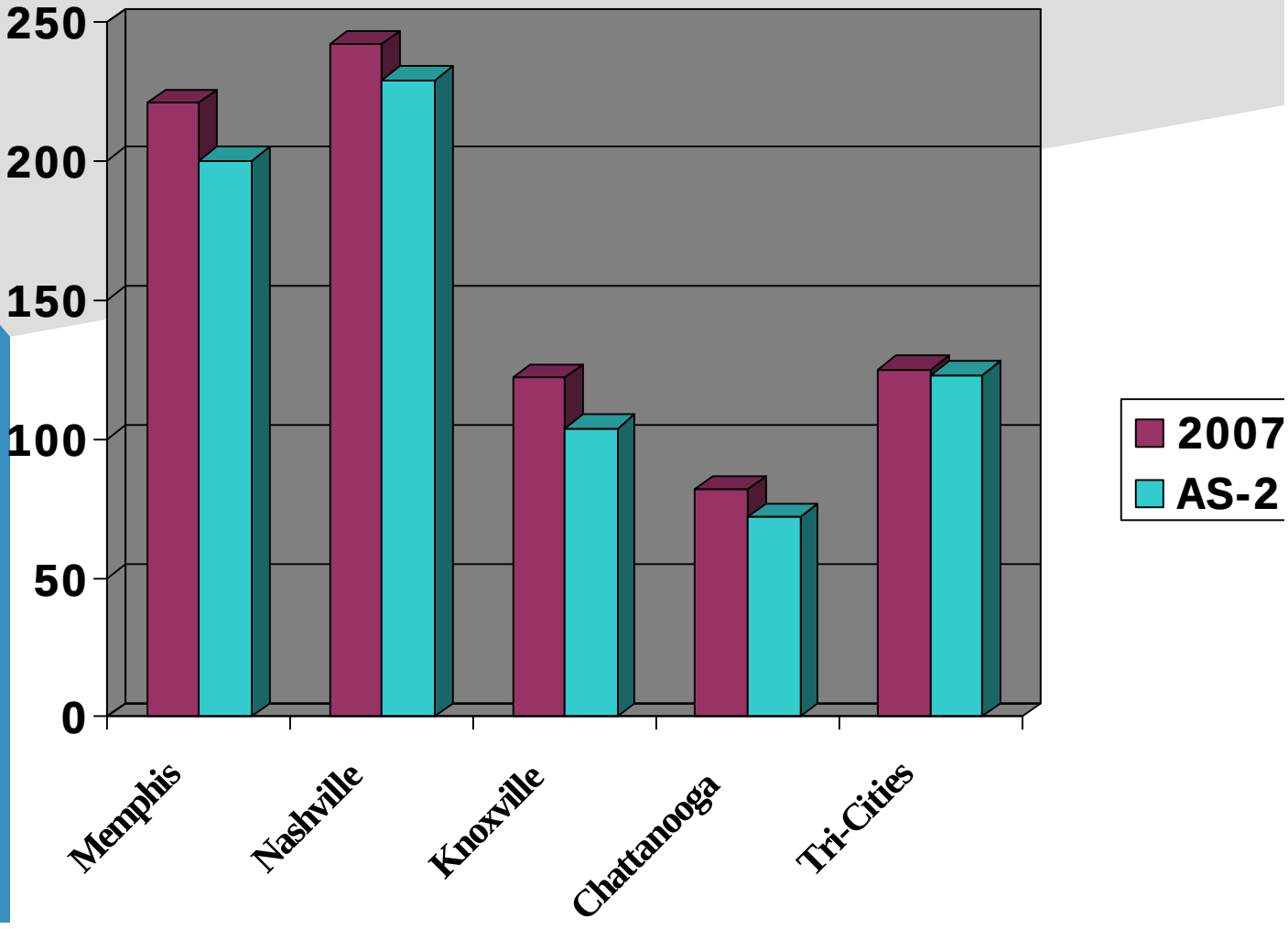
CHATTANOOGA EAC MEASURES

- Area-source measures
  - Open burning ban – residential garbage
  - Open burning ban – yard waste
  - Open burning ban – land clearing
  - Stage I vapor recovery
  - Stage II vapor recovery
  - Lower gasoline RVP (9.0 to 7.8)
  - Ozone Action Day measures
- Non-road measures
  - Construction equipment (10% new)
  - New airport vehicles (10% new)

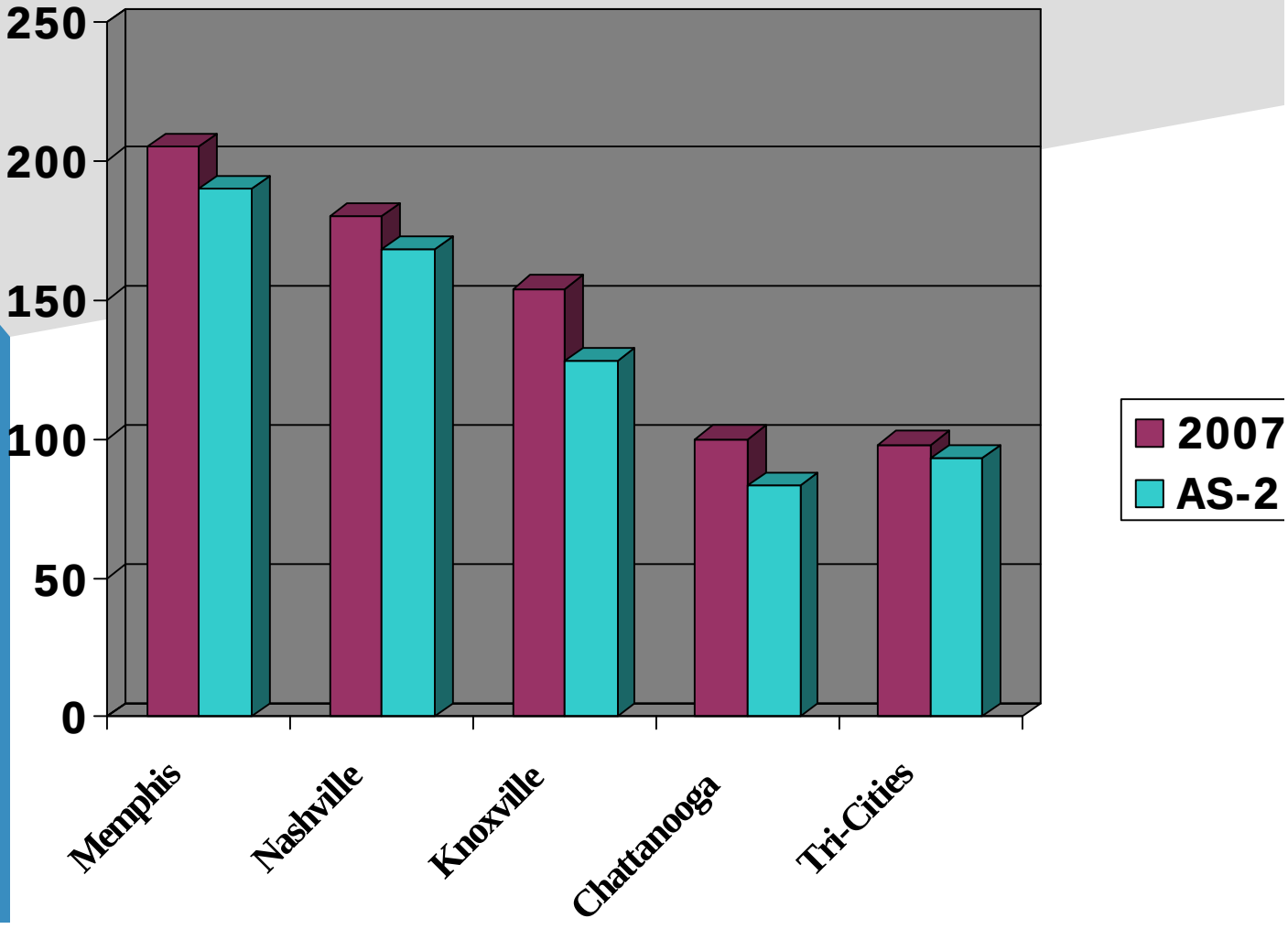
CHATTANOOGA EAC MEASURES (concluded)

- On-road mobile measures
  - Inspection/maintenance (OBD only)
  - Lower interstate truck speeds 10 mph
  - Truck stop electrification (10% of sites)
  - Cetane added to diesel
  - Anti-idling restrictions
  - Transit (increase bus ridership 10%)
- Point-source measures
  - NOx RACT on selected sources

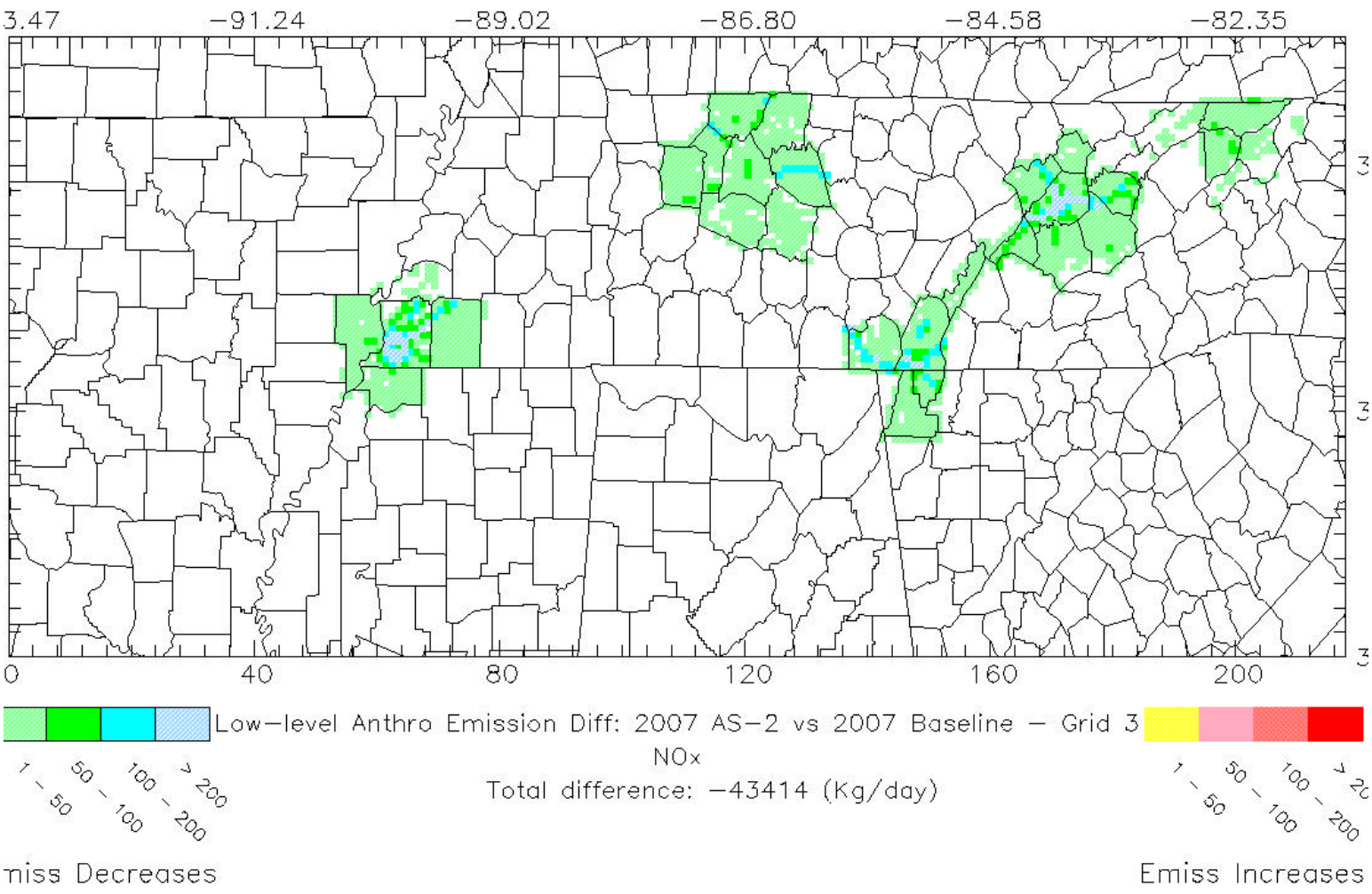
TOTAL NOX EMISSIONS (TPD
FOR REVISED BASELINE AND
"ALL MEASURES" STRATEGY



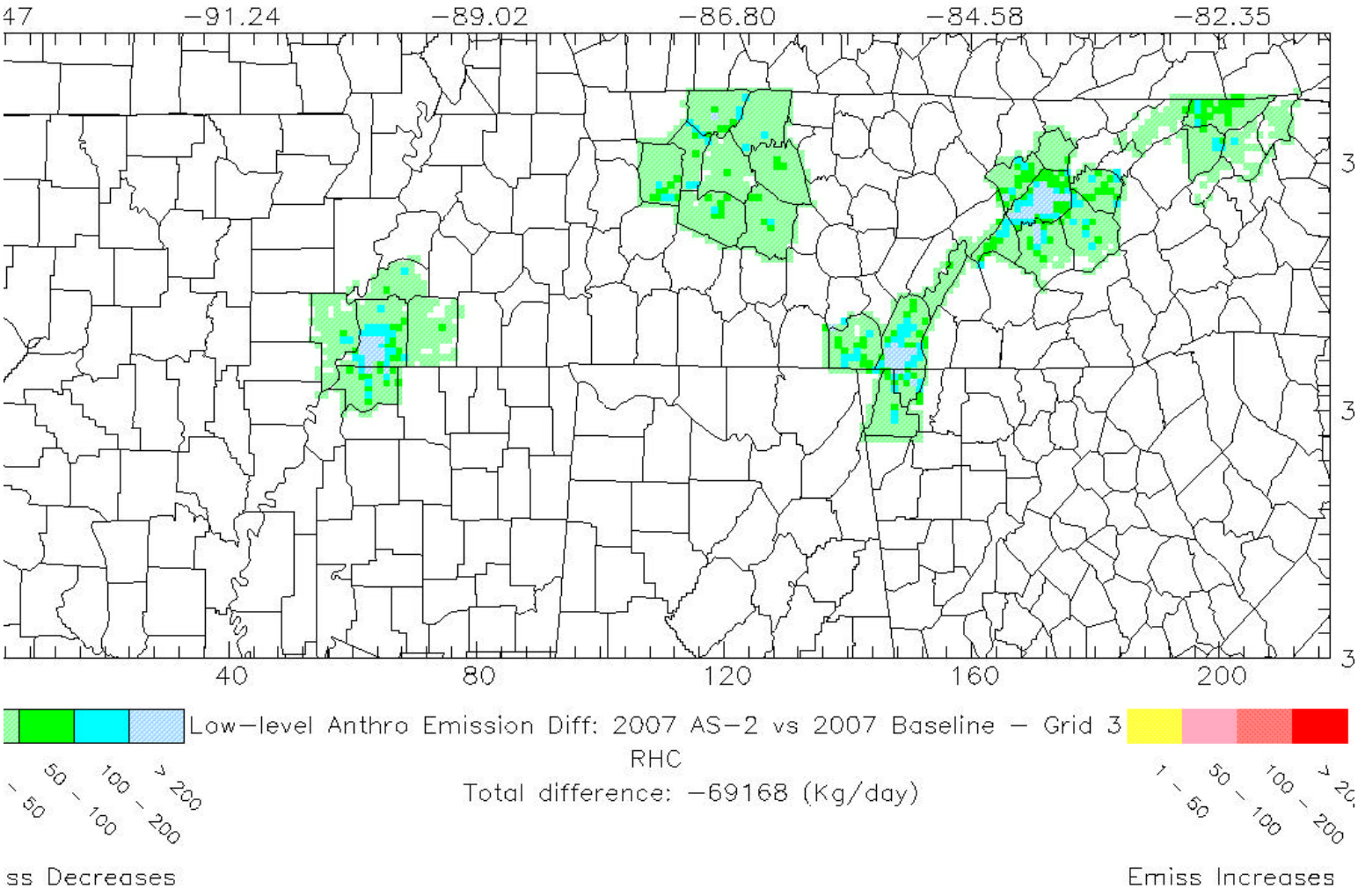
TOTAL VOC EMISSIONS (TPD
FOR REVISED BASELINE AND
"ALL MEASURES" STRATEGY



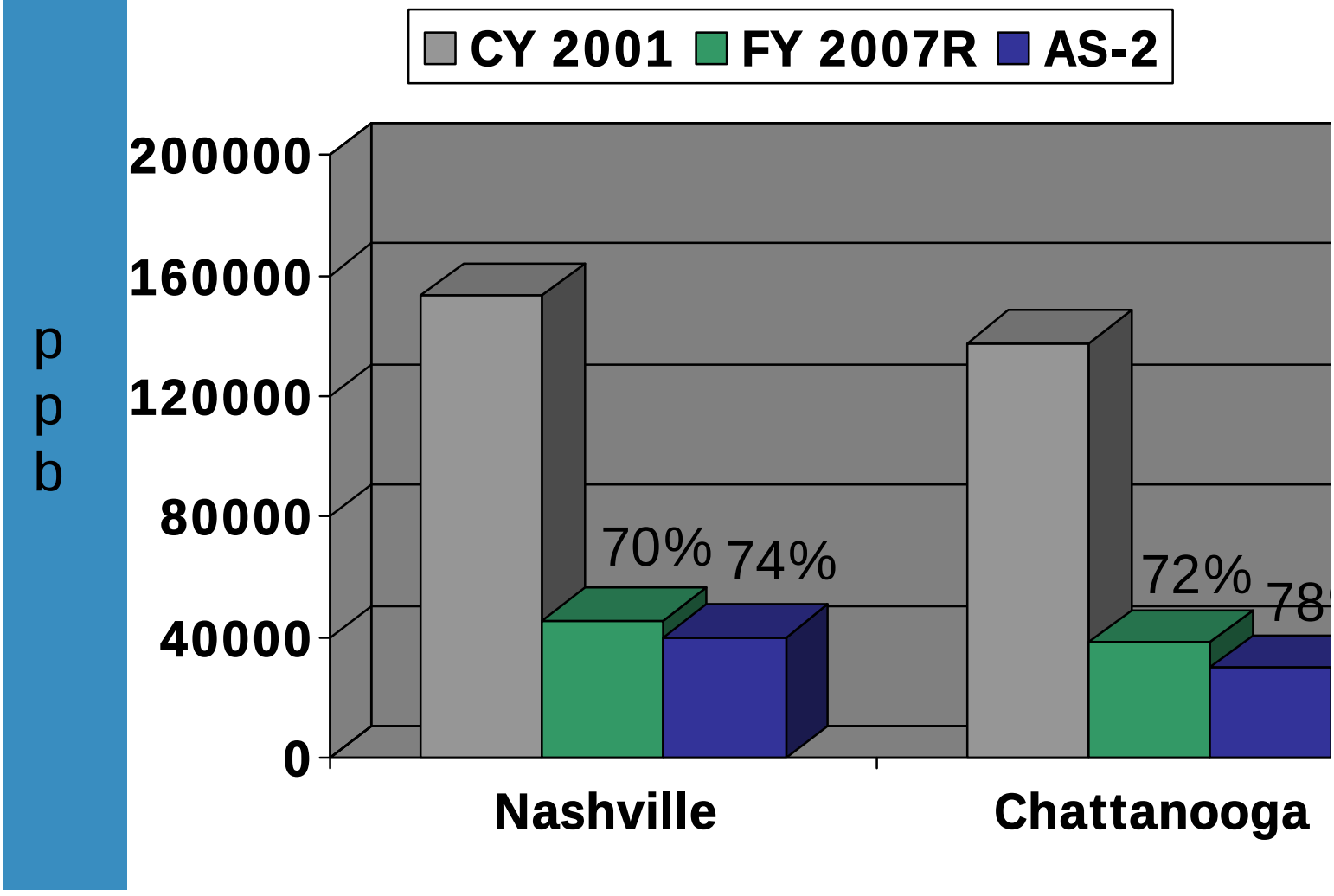
OW-LEVEL NOX REDUCTIONS FO
AS-2 : "ALL MEASURES" SCENARI



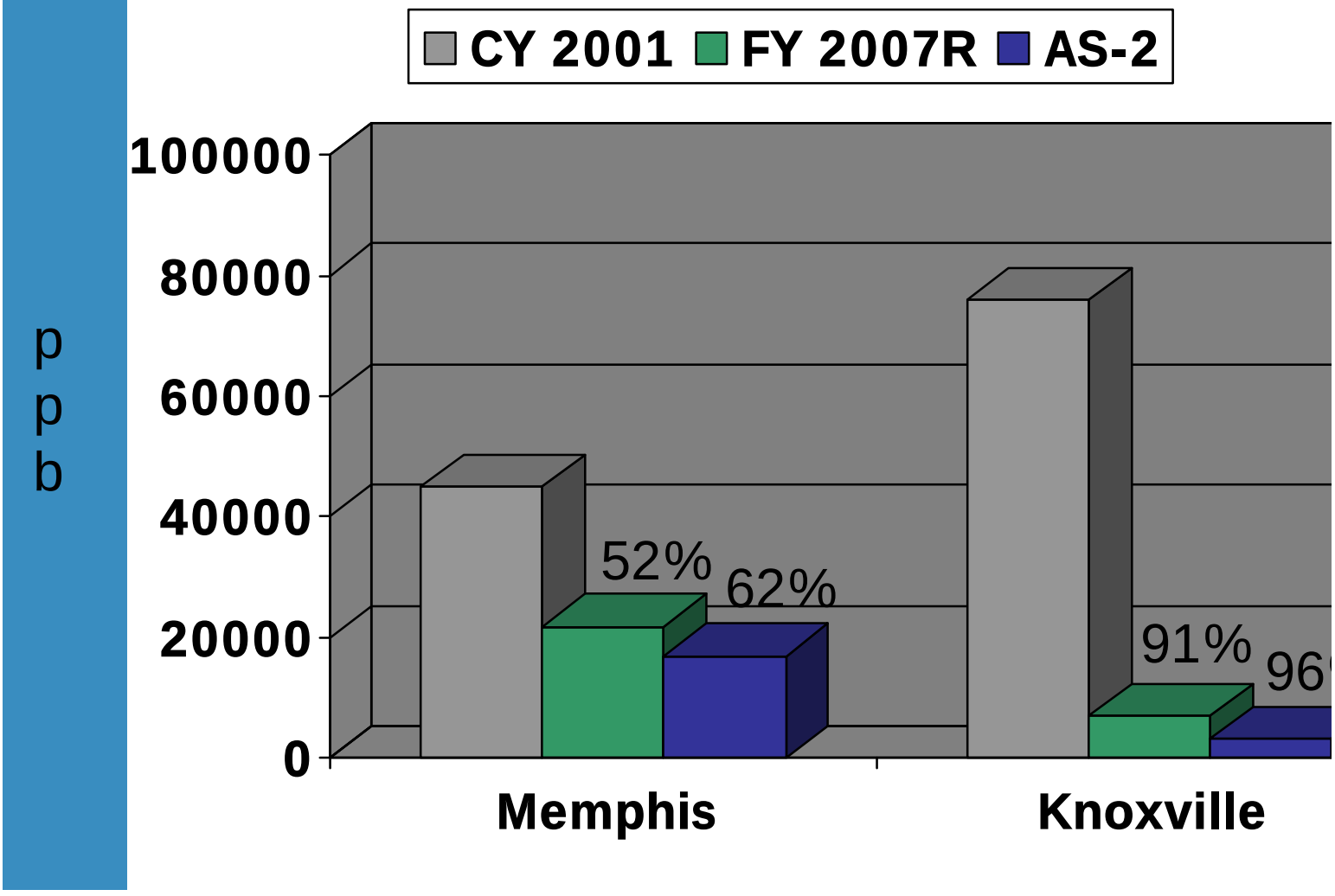
LOW-LEVEL VOC REDUCTIONS FO
AS-2 : "ALL MEASURES" SCENARI



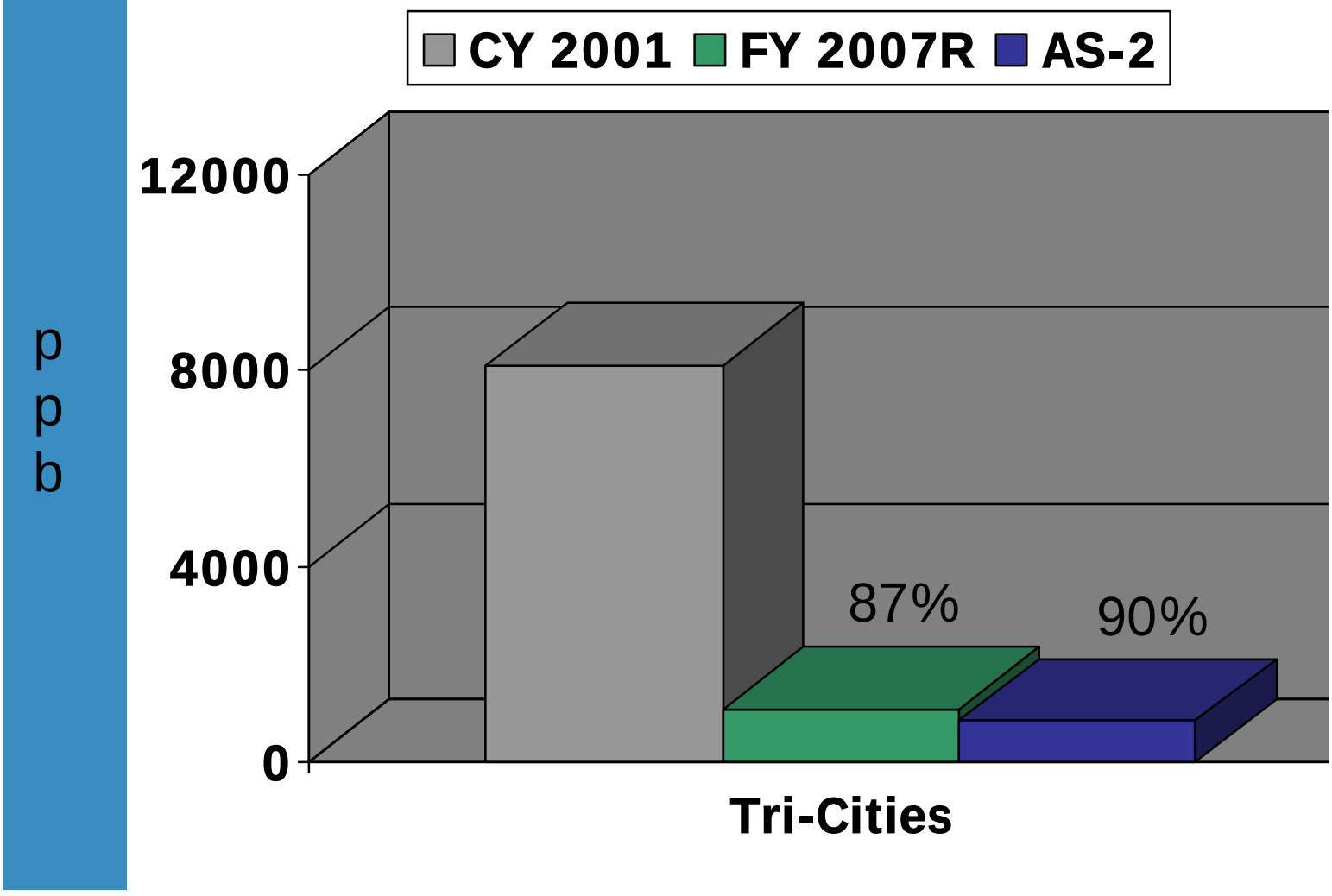
COMPARISON OF SIMULATED 8-H
OZONE EXCEEDANCE EXPOSUR



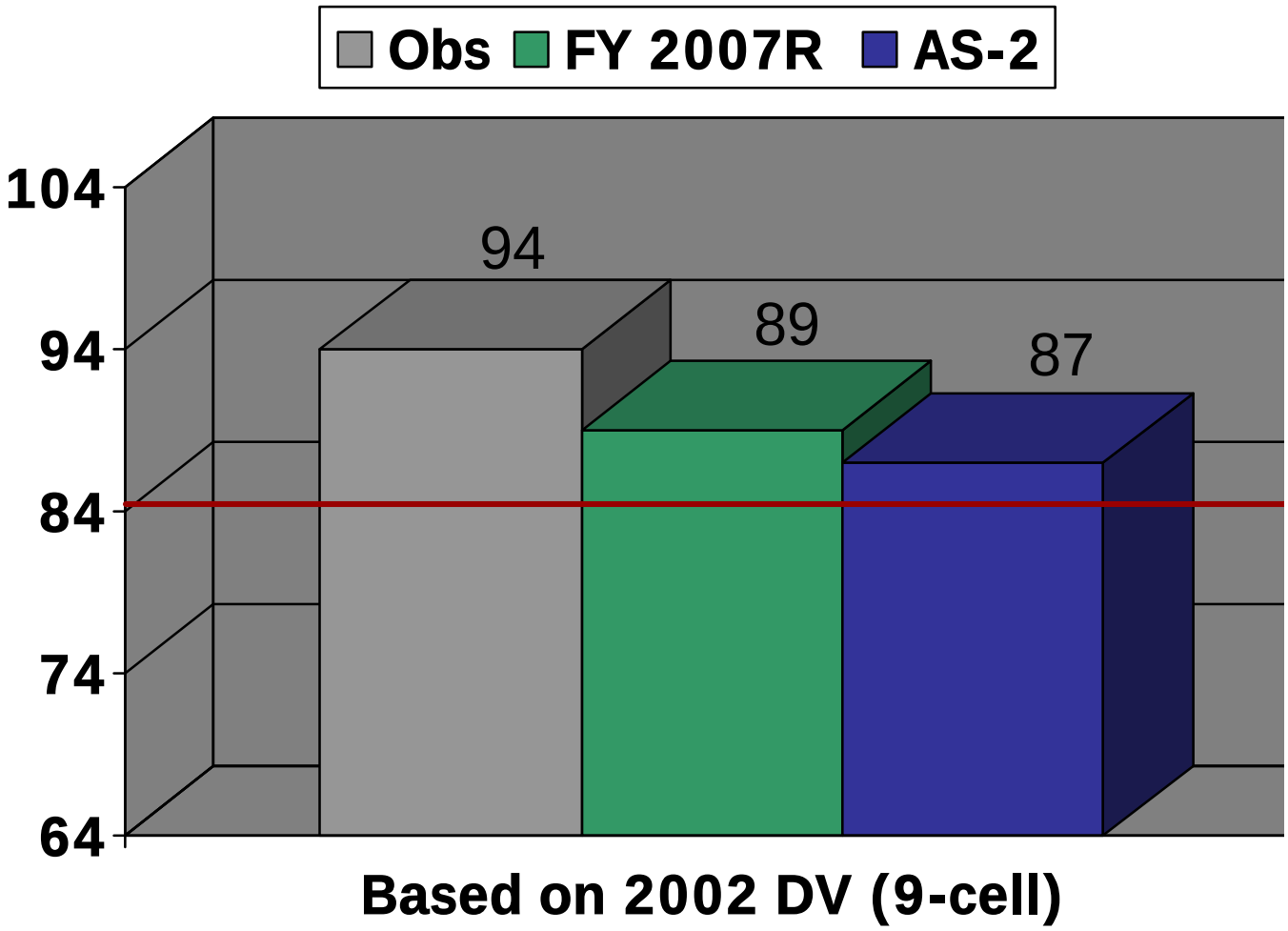
COMPARISON OF SIMULATED 8-H
OZONE EXCEEDANCE EXPOSUR



COMPARISON OF SIMULATED 8-H
OZONE EXCEEDANCE EXPOSUR



ESTIMATED DESIGN VALUE (EDV
MEMPHIS AREA



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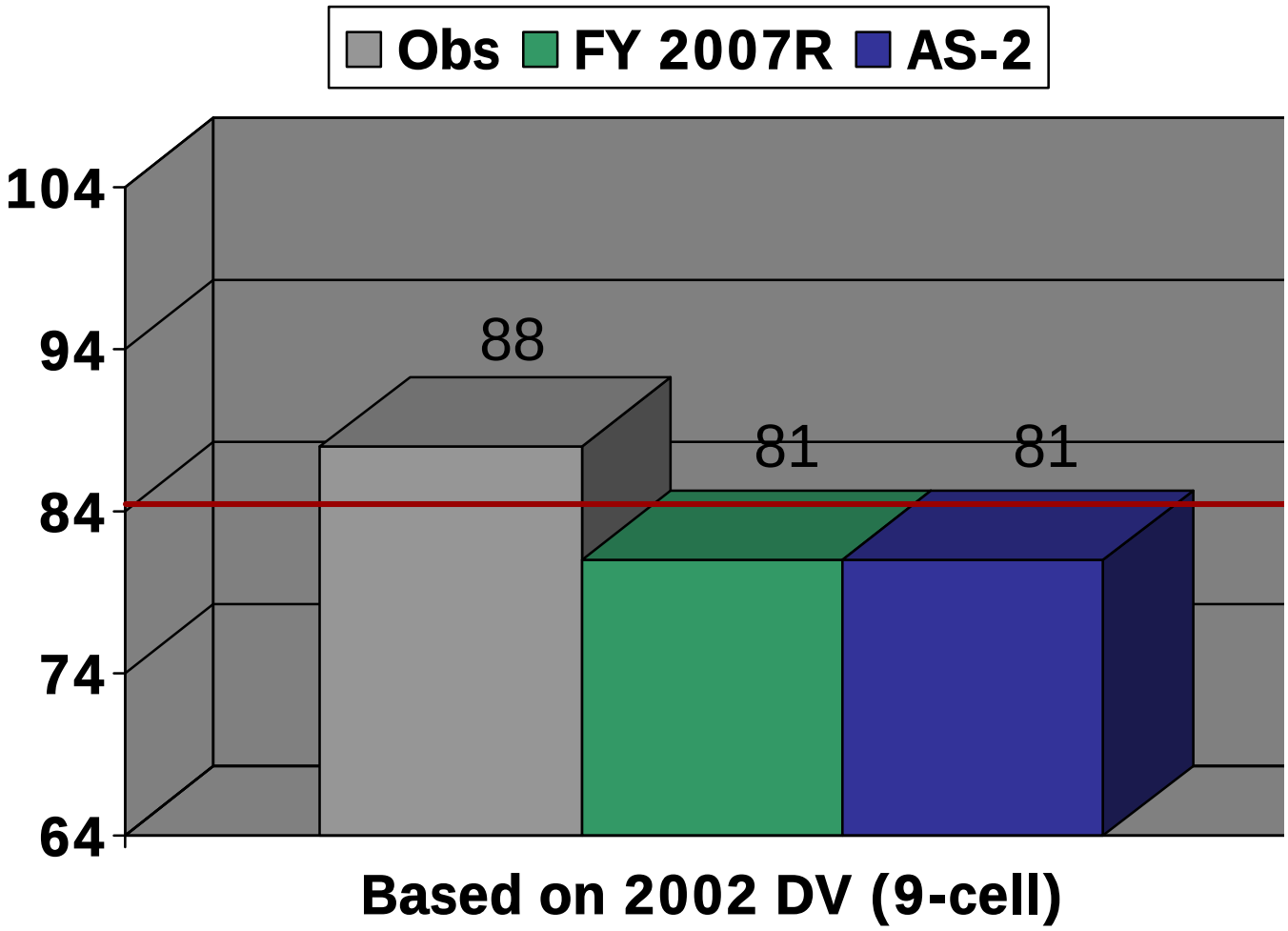
ESTIMATED DESIGN VALUE (EDV
NASHVILLE AREA



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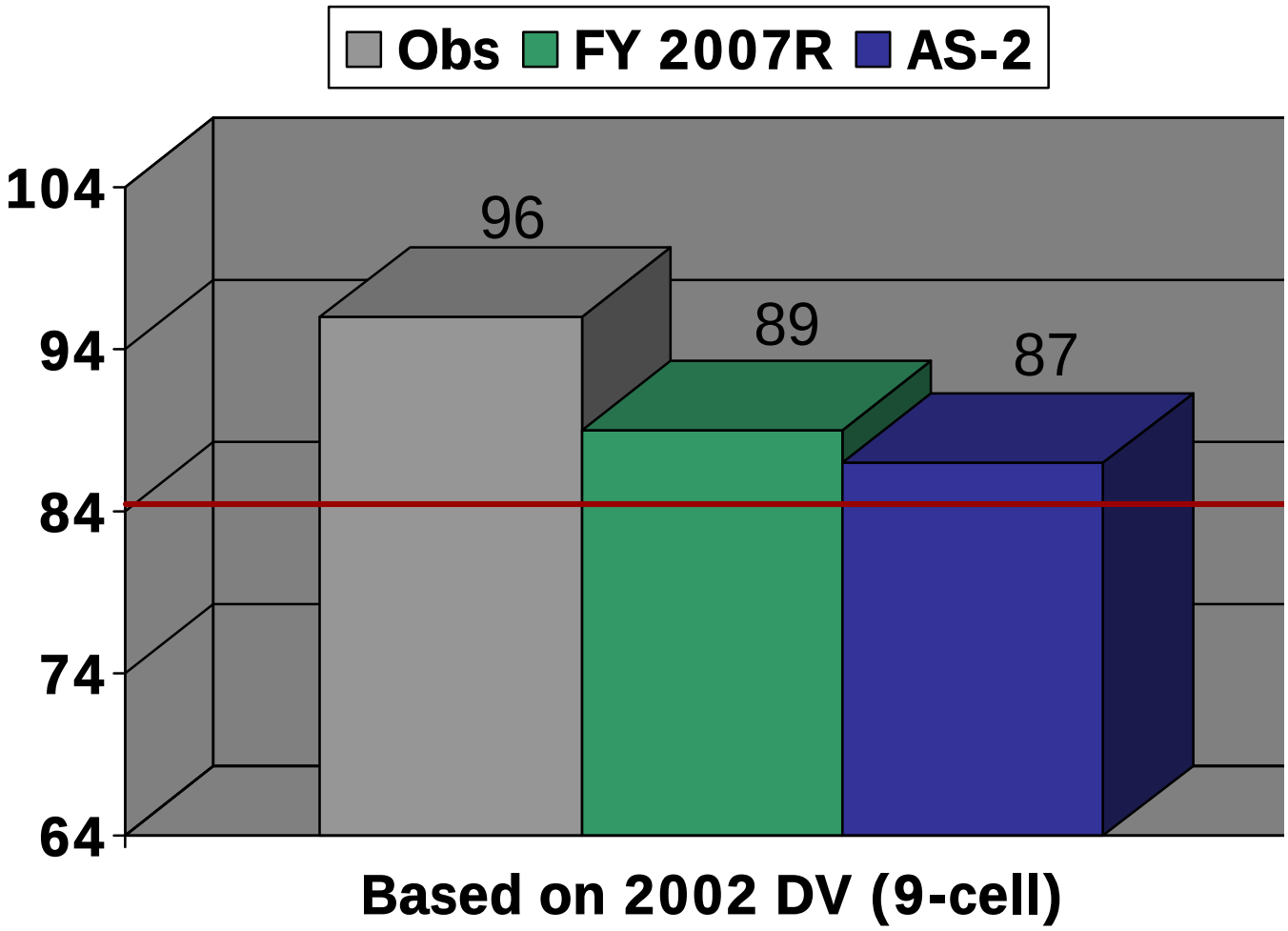
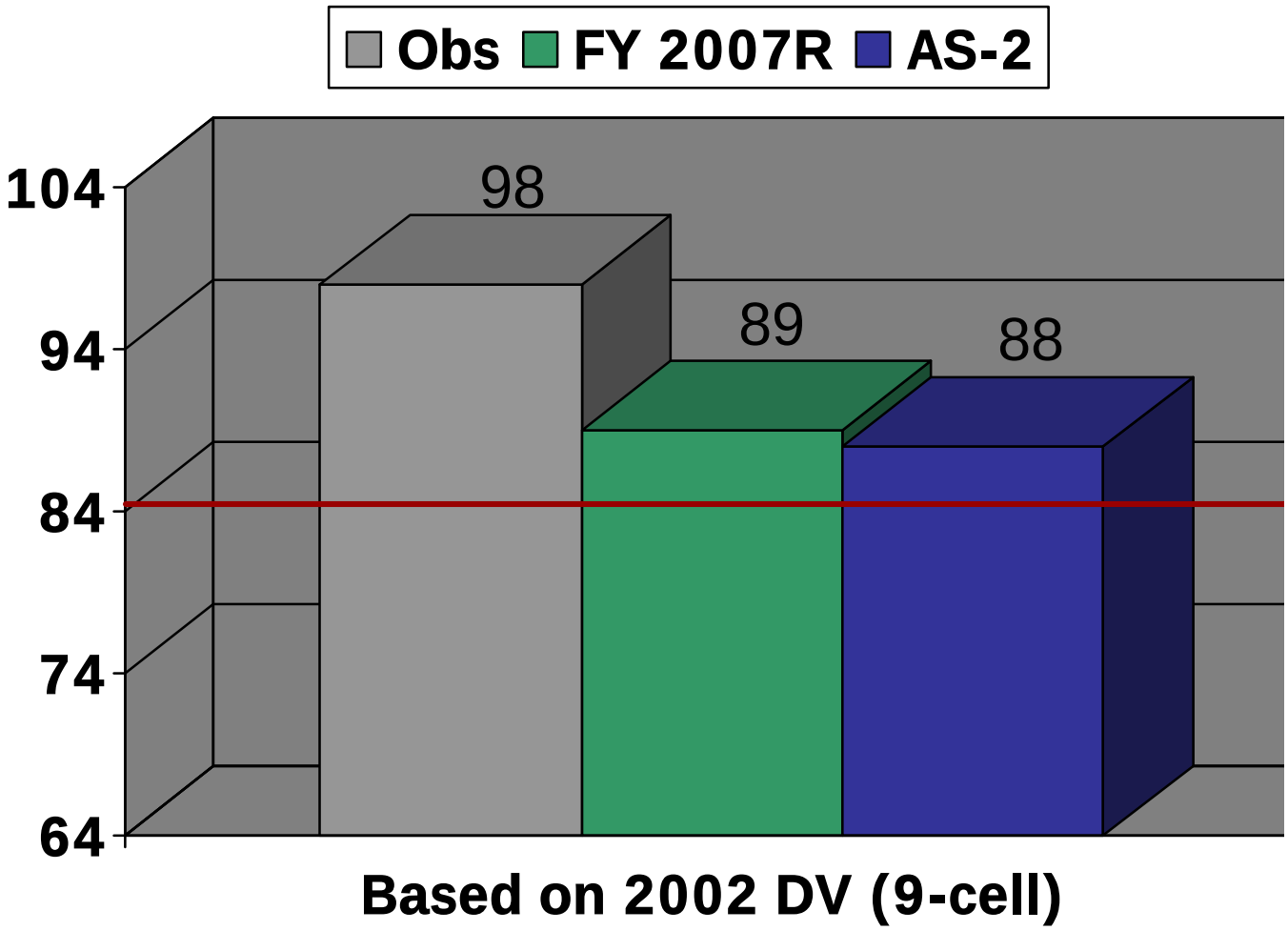
ESTIMATED DESIGN VALUE (EDV
KNOXVILLE AREA

ppb

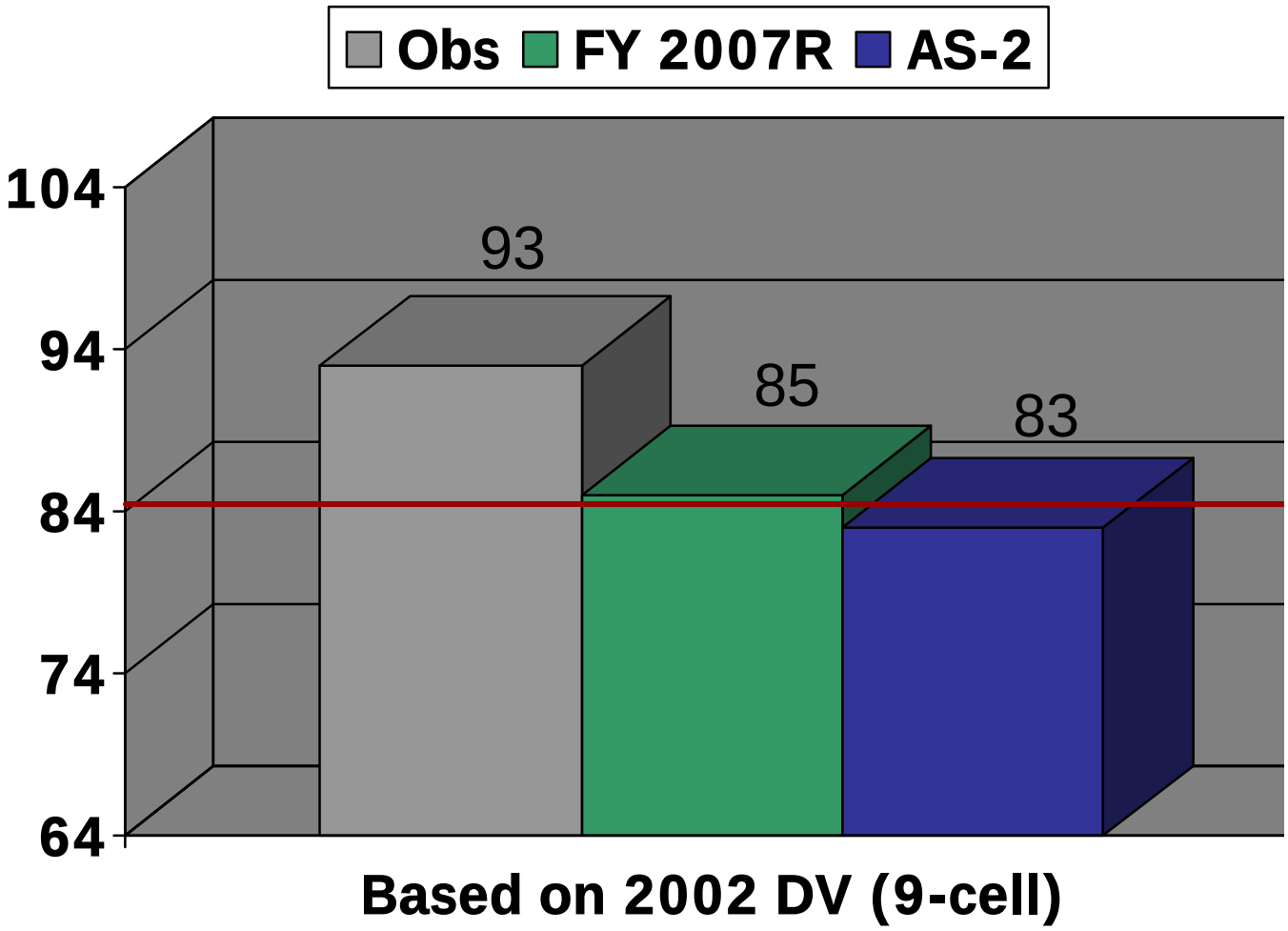


ESTIMATED DESIGN VALUE (EDV
GSM AREA

ppb

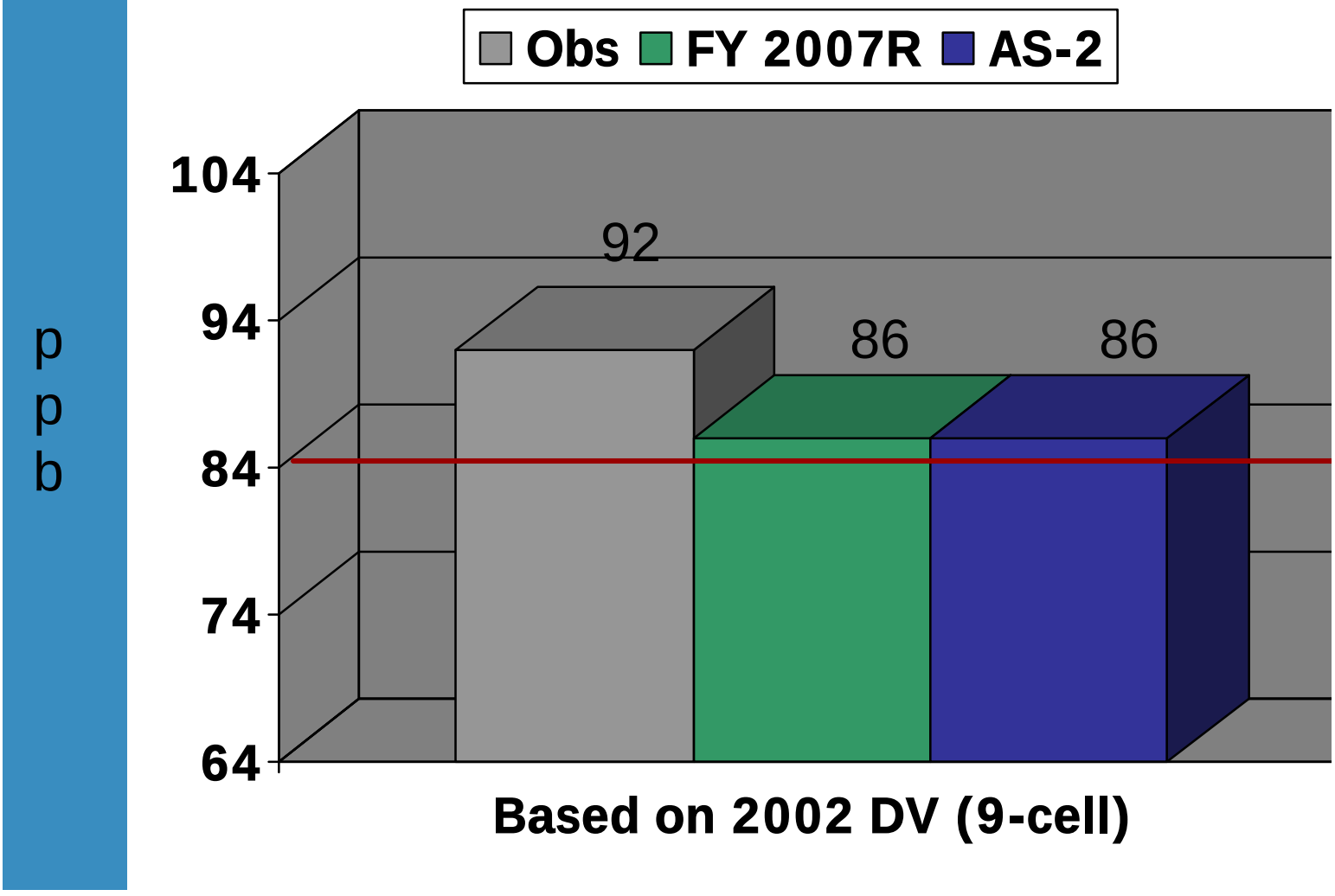


ESTIMATED DESIGN VALUE (EDV
CHATTANOOGA AREA



ppb

ESTIMATED DESIGN VALUE (EDV
TRI-CITIES AREA



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SUMMARY OF AS-2 RESULTS

- Compared to the revised baseline, 8-hour ozone exceedance exposure is lower by
  - 22% for Memphis EAC area
  - 12% for Nashville EAC area
  - 54% for Knoxville EAC area
  - 21% for Chattanooga EAC area
  - 23% for Tri-Cities EAC area

SUMMARY OF AS-2 RESULTS (CONTINUED)

- EDVs are lower by 2 ppb for the Memphis Knoxville and Chattanooga areas and unchanged for the Nashville and Tri-Cities areas (varies a little with 15-km approach)
- Values are
  - 87 ppb for Memphis EAC area
  - 81 ppb for Nashville EAC area
  - 87 ppb for Knoxville EAC area
  - 83 ppb for Chattanooga EAC area
  - 86 ppb for Tri-Cities EAC area

ATTAINMENT DEMONSTRATION ANALYSIS

- Attainment demonstration consists o
  - Attainment test
  - Screening test
  - Additional weight of evidence

OVERVIEW OF THE MODELED TTAINMENT TEST: SITE-SPECIFI

- Determine the 8-hour ozone design value for eac monitoring site (3-year average of the annual 4th highest 8-hour ozone concentration)
- Use UAM-V results to calculate a relative reductio factor (RRF) for each monitoring site - defined as ratio of the future- to base-year 8-hour maximum ozone concentration in the "vicinity" of the site
- Multiply the current-year design value by the RRF estimate the future design value
- If future site-specific design values are ≤ 84 ppb, test is passed

OVERVIEW OF THE SCREENING TEST

- Examine the modeling results and determine wh there are areas in the domain where the simulat concentrations are consistently greater than any the vicinity of a monitoring site using the followi definitions:
  - *Area in the domain*: array of cells centered on grid cell where simulated concentrations are consistently greate than any near a monitored location
  - *Consistently*: simulated 8-hour maximum concentratio more than 5% higher than any near a monitor on 50% more of the simulation days

OVERVIEW OF THE SCREENING TEST (CONCLUDED)

- Use UAM-V results to calculate a RRF for such unmonitored area
- Multiply the maximum current-year design value for the nonattainment area by the R (for the unmonitored location) to estimate the future design value for the unmonitor location of interest
- If the estimated future design value for th unmonitored location is ≤ 84 ppb, the tes passed

WEIGHT OF EVIDENCE

- Possible elements include
  - EPA recommended additional metrics (related change in exceedance hours and exposure)
  - Emissions trends
  - Observed ozone (and design value) trends; design value representativeness
  - Uncertainty in the modeling associated with
    - Modeling system (including input) errors and approximations ("noise")
    - Episode representativeness
    - Model performance issues
    - Emissions projections

WEIGHT OF EVIDENCE (CONTINUED)

- Possible elements include
  - Uncertainty attributed to application of the attainment and screening test procedures
    - Definition of vicinity/Site-specific vs. grid based RRF
    - Day selection (number and type of days, e.g., accounting for frequency of occurrence)
  - Transport assessment (e.g., using tagging results)

WEIGHT-OF-EVIDENCE CONSIDERATIONS FOR MEMPHIS

- Findings to date:
  - 8-hour exceedance exposure reduced by approximately
  - 2007 EDV for AS-2 is 87 ppb (86 if 15-km approach is u
  - EDVs for 3 of 4 sites are well below 84 ppb
- Required and recommended analysis:
  - **Screening test** (apply for subset of domain surroundi Memphis EAC)- examine site-specific and grid based approaches
  - Calculate additional recommended metrics
  - Examine episode and **DV representativeness** and me adjusted 8-hour ozone trends (using CART results)
  - Examine effects of **modeling uncertainties**
  - Examine **alternative attainment test procedures**

WEIGHT-OF-EVIDENCE ONSIDERATIONS FOR NASHVILL

- Findings to date:
  - 8-hour exceedance exposure reduced by approximately
  - 2007 EDV for AS-2 is 81 ppb (80 if 15-km approach is u
  - EDVs for all sites are below 84 ppb
- Required and recommended analysis:
  - Screening test (apply for subset of domain surrounding Nashville EAC)- examine site specific and grid based approaches
  - Calculate additional recommended metrics
  - Examine **episode and DV representativeness** and r adjusted 8-hour ozone trends (using CART results)
  - Examine effects of **modeling uncertainties (good performance)**
  - Examine **alternative attainment test procedures**

WEIGHT-OF-EVIDENCE ONSIDERATIONS FOR KNOXVILL

- Findings to date:
  - 8-hour exceedance exposure reduced by approximately 96%
  - 2007 EDV for AS-2 is 87 ppb
- Required and recommended analysis:
  - **Screening test** (apply for subset of domain surroundi Knoxville EAC)- examine site-specific and grid based approaches
  - Calculate **additional recommended metrics**
  - Examine **episode and DV representativeness** and r adjusted 8-hour ozone trends (using CART results)
  - Examine effects of modeling uncertainties and **transpo**
  - Examine alternative attainment test procedures

WEIGHT-OF-EVIDENCE NSIDERATIONS FOR CHATTANO

- Findings to date:
  - 8-hour exceedance exposure reduced by approximately
  - 2007 EDV for AS-2 is 83 ppb
  - EDVs for all sites (including potential upwind site) <= 8
- Required and recommended analysis:
  - **Screening test** (apply for subset of domain surroundi Chattanooga EAC)- examine site-specific and grid base
  - Calculate **additional recommended metrics**
  - Examine episode and **DV representativeness** and me adjusted 8-hour ozone trends (using CART results)
  - Examine effects of **modeling uncertainties (v. good perfomance) and transport**
  - Examine alternative attainment test procedures

WEIGHT-OF-EVIDENCE ONSIDERATIONS FOR TRI-CITIE

- Findings to date:
  - 8-hour exceedance exposure reduced by approximately
  - 2007 EDV for AS-2 is 86 ppb (87 if 15-km approach is u
- Required and recommended analysis:
  - **Screening test** (apply for subset of domain surroundi Tri-Cities EAC)- examine site specific and grid based approaches
  - Calculate **additional recommended metrics**
  - Examine **design value and episode representative**
  - Examine effects of **modeling uncertainties (some n performance issues)**
  - Examine alternative attainment test procedures

2007 ATMOS/EAC MODELING NEXT STEPS (FOR DISCUSSION)

- Incorporate final updates to emissions and finalize 2007 baseline simulation
  - Finalize VMT estimates by 1/10
  - Incorporate gas compressor and other point source emissions changes
- Refine and test (additional?) control strategies, prepare emissions and conduct attainment-strategy simulation(s)
  - Add UT reports to ATMOS web site by 12/22
  - Each area to revisit/refine/finalize measures by 1/17 or 1/24
- Conduct attain. demo analysis/document

2007 ATMOS/EAC MODELING NEXT STEPS (FOR DISCUSSION)

- Next meeting 2/12-2/13/04 (Memphi area)